Manitoba
Healthy Living

Stroke Services Environmental Scan

Manitoba

Index

1.0 Executive Summary 5
2.0 Introduction 6
2.1 Definition: Best Practices and Guidelines 6
2.2 Definition: Continuum of Care 7
2.3 Research Methodology 9
3.0 Quantitative Review of Stroke Care in Manitoba 10
3.1 Service Volumes 10
3.2 Utilization – Demographics 11
3.3 Utilization – In-Region and Out-of-Region Care 12
3.4 Utilization – Length of Stay 14
4.0 Summary of Environmental Scan Survey by Region 15
5.0 Health Promotion and Primary Prevention 16
5.1 Best Practice 16
5.2 Key Findings 16
5.3 Opportunities 20
6.0 Pre-hospital and Emergency Care 21
6.1 Best Practice 21
6.2 Key Findings 21
6.3 Opportunities 24
7.0 Acute Care and Treatment 26
7.1 Best Practice 26
7.2 Key Findings 26
7.3 Opportunities 28
8.0 Stroke Rehabilitation 29
8.1 Best Practice 29
8.2 Key Findings 29
8.3 Opportunities 33
9.0 Secondary Prevention 34
9.1 Best Practice 34
9.2 Key Findings 34
9.3 Opportunities 36
10.0 Community Re-engagement and Reintegration 37
10.1 Best Practice 37
10.2 Key Findings 37
10.3 Opportunities 39
11.0 Transition Management 40
11.1 Best Practice 40
11.2 Key Findings 40
11.3 Opportunities 44
12.0 Stroke Education 45
12.1 Key Findings 45
12.2 Opportunities 47
13.0 Appendices 48
13.1 Appendix 1 – Environmental Scan Survey 48
13.2 Appendix 2 – Policies/Protocol/Guidelines 68

13.3 Appendix 3 - Additional Data *69*
13.4 Appendix 4 - Inter-Provincial Stroke Services *75*
13.5 Appendix 5 - Recommendations from Canadian Stroke Strategy *76*
13.6 Appendix 6 - CTAS Guideline *86*
13.7 Appendix 7 - CT Scanner Locations in Manitoba *87*
13.8 Appendix 8 - Community Referral Practices *88*
13.9 Appendix 9 - Other Referenced Tables *90*
13.10 Appendix 10 - Pediatric Stroke in Manitoba *101*
13.11 Appendix 11 - Acknowledgments *105*

1.0 Executive Summary

An environmental scan of stroke services in Manitoba was completed in December of 2006 to compare existing stroke services and resources to best practices, and to assess the degree to which stroke services are integrated across the continuum of care. Regional health authorities were asked to provide the Stroke Advisory Committee with current policies and information regarding programs, services and resources relevant to providing stroke care in Manitoba.

The results show that while there are specific areas where current practice is consistent with accepted best practice guidelines, there are many areas within and across regions where there are opportunities to improve knowledge, co-ordination of services, consistency of current practice with best practice guidelines, and sharing and implementation of resources between regions. Available technology is neither effectively used to improve stroke care nor to provide access to the best care. Most regions indicated that they are aware of the gaps in integration and service delivery. This environmental scan helps to focus the regions and the province on areas where significant system improvements can be obtained, and as a result will facilitate better patient outcomes.

The survey indicates that the regions overall have good health promotion and primary prevention strategies in place. These strategies are not specific to stroke, but as the risk factors for other chronic diseases, vascular diseases and stroke are the same, the regions are encouraged to maintain practice in this area and increase messaging related to stroke. Stroke recognition knowledge (both for public and health care professionals) however is not well addressed in general, and regions are encouraged to strengthen partnerships with the Heart and Stroke Foundation of Manitoba for educational and health promotion resources.

Numerous diabetes prevention clinics exist in the rural areas of Manitoba. This valuable medium should be explored to see whether broadening the scope of the clinics to address primary prevention of other chronic diseases, including stroke, is possible within existing resources. Additional stroke-related messaging could improve awareness and prevention of strokes.

Related to pre-hospital and emergency services, there is a lack of stroke specific protocols and care paths. Most regions indicate that the Provincial Emergency Medical Treatment Guidelines are being used. Manitoba must ensure these guidelines are consistent with current knowledge and advances in emergency stroke care.

Many rural regions indicate that their patients are referred to an Acute Stroke Unit (ASU). There is currently no ASU in the province, which presents a gap in the delivery of stroke care. An ASU will care for the acute phase of the stroke whereafter the patients will be sent home, transferred for acute rehabilitation, or to an alternate setting of care. The Winnipeg Regional Health Authority is in the process of establishing such a unit. Clear admission criteria, referral processes, and repatriation policies must be developed to properly manage transitions into and from the ASU.

The lack of therapy resources in the rural areas was mentioned by most of the rural regions. Standardized outcome measures and assessment tools are not used consistently and appropriate rehabilitation patients may not always receive intensive rehabilitation. Consolidation of stroke rehabilitation services should enable intensity of therapy as outlined by the Canadian Stroke Strategy, better access to service and improved patient outcomes.

Follow-up services, secondary prevention strategies, patient education and co-ordination, and integration of services and information flow to enable smooth transition across the continuum are additional areas of opportunity.

2.0 Introduction

The purpose of this environmental scan is to provide Manitoba Health and the regional health authorities of Manitoba with a province-wide, health-region specific inventory of current policies, programs, services and resources relevant to providing stroke care in Manitoba.

This report will present the findings of the environmental scan and is intended to assist the Provincial Stroke Framework Advisory Committee to identify gaps along the continuum of care for stroke patients. In addition, recommendations will be provided as appropriate for implementing best practices, standards and guidelines for stroke care and stroke patient management in Manitoba.

The starting point for the research was the Heart and Stroke Foundation of Ontario's "Best Practice Guidelines for Stroke Care" (2003). These guidelines are Canadian, comprehensive, current and encompass the continuum of care. These best practices provide the structure against which the environmental scan survey was designed.

Recommendations and considerations included in this report will also, where possible, reflect the recommendations from the Canadian Stroke Strategy's Canadian Best Practice Recommendations (2006)[1].

It is important to note that the intent of the environmental scan is not to assess or evaluate whether the best practices were in fact clinically sound and appropriate. It is assumed that this evaluation was included in the scope of work completed by The Heart and Stroke Foundation of Ontario (HSFO) in developing the guidelines in 2003. Additional evidence of the excellent work by HSFO is the reference to their document by the Canadian Stroke Strategy as "the most relevant and comprehensive set of guidelines."[2]

The intended audience for this environmental scan includes the members of the Provincial Stroke Framework Advisory Committee (PSFAC), regional health authority executives, stroke clinicians and non-clinician stakeholders responsible for co-ordination of health care services and resources within Manitoba. This report is written for an audience that may have no clinical background in stroke.

2.1 Definition: Best Practices and Guidelines

For the purposes of this report, the definition of best practices has been borrowed from the Canadian Stroke Strategy. Best practices are defined as "emerging guidelines, gleaned from key expert perspectives and supported by literature and data on the approaches and elements of treatment that appear to result in successful treatment outcomes for stroke prevention, treatment and rehabilitation." Given this definition, best practices are recommendations that may evolve, based on ongoing key expert experience, judgment and perspective and continued research.[3]

Guidelines may include processes developed for clinical practice and/or policy. For the purposes of this report, health regions were asked to identify local practices and standards consistent with best practices included in "Best Practice Guidelines for Stroke Care" (2003 -The Heart and Stroke Foundation of Ontario) that span the "continuum of care."

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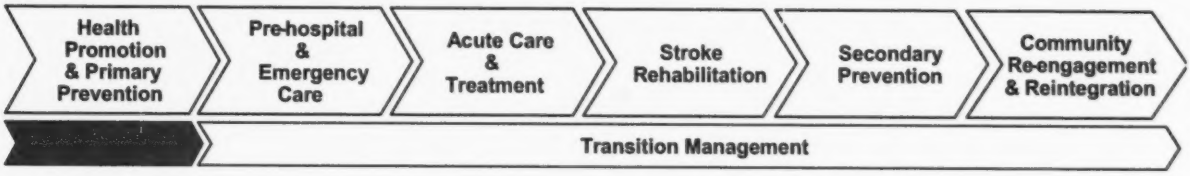
[1] *Canadian Best Practice Recommendations for Stroke Care: 2006: Canadian Stroke Strategy (2006)*
[2] *Canadian Stroke Strategy: Best Practices & Standards Working Group Environmental Scan Report March 31, 2006*
[3] *Canadian Stroke Strategy: Best Practices & Standards Working Group Environmental Scan Report March 31, 2006*

Definition: Continuum of Care

To provide structure for this report, the continuum of care terminology is used for consistency with the Canadian Stroke Strategy.[4] Figure 1 depicts the continuum of care as described by the Canadian Stroke Strategy, which provides the outline for this report. The environmental scan is divided into sections along the continuum, each of which is described briefly below.

Figure 1. Continuum of Care



Note: this figure will appear in the footer of the environmental scan survey section of the report. The area of the continuum will be highlighted to assist the reader to identify each section.

The continuum of care consists of the following areas:

- **Health Promotion and Primary Prevention:** Within the context of this report, health promotion includes population-based activities and campaigns intended to raise awareness, change behaviours and/or create environments that support good health practices. These activities may be done by health regions, health care providers and/or other agencies (ex: The Heart and Stroke Foundation of Manitoba). Primary prevention is an individual-based clinical approach to disease prevention implemented in the primary care setting for otherwise healthy individuals with modifiable risk factors.[5]

- **Pre-hospital and Emergency Care:** Pre-hospital care includes treatment and protocols initiated by paramedics and other ambulance personnel prior to arrival to an acute care setting. Emergency care includes treatment and protocols initiated by emergency physicians, nurses and other emergency staff upon arrival to hospital.

- **Acute Care & Treatment:** Generally described to be the first seven days following a stroke, acute care generally takes place in a hospital setting.[6]

- **Stroke Rehabilitation**: Rehabilitation focuses on improving the abilities of the stroke survivor to facilitate independence and social integration.[7]

- **Secondary Prevention:** Secondary prevention of stroke is an individually based, clinical approach to reducing the risk of events in persons who are experiencing symptoms that place them at high risk of a stroke or have already experienced a transient ischemic attack (TIA) or mild non-disabling stroke. Prevention strategies may include medication, surgery and support in making changes to lifestyle.[8]

- **Community Re-engagement & Reintegration**: Community re-engagement focuses on processes and supports that maximize the likelihood of stroke survivors feeling empowered and achieving their

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[4] *Originally adapted from the Ontario Blue Book – Towards an Integrated Stroke Strategy for Ontario – Report of the Joint Stroke Strategy Working Group June 2000; the Ontario Best Practice Guidelines for Stroke Care; and the results of the Canadian Stroke Strategy Information & Evaluation Consensus Panel, September 2005.*

[5] *Heart and Stroke Foundation of Ontario, Best Practice Guideline for Stroke Prevention*

[6] *Canadian Stroke Strategy: Best Practices & Standards Working Group Environmental Scan Report March 31, 2006*

[7] *Heart and Stroke Foundation of Ontario, Best Practice Guideline for Rehabilitation Management*

[8] *Coordinated Stroke Strategy Website*

personal goals.[9] This includes evolving care plans and regular follow-up assessments by health care professionals.

Additionally, we have included Transition Management as a separate section due to the additional complexity of looking at intra-region and inter-region transfers and integration of services.

- **Transition Management**: Transition management focuses on policies and processes that ensure continuity and consistency in care across the continuum. Transition includes not only intra-region transfer between facilities and care programs, but also inter-region transfer for access to services not available within the region of origin.

2.2 *Research Methodology*

A Statement of Work was prepared in June 2006 and agreed to by the working group regarding the survey methodology that guided the environmental scan exercise.

To conduct the environmental scan, a survey was designed to assist representatives of the regional health authorities to identify examples of resources, equipment, practices, policies or protocols that are consistent with best practice guidelines. The survey and accompanying introductory letter explaining the intent of the environmental scan was sent to chief executive officers (CEOs) in each of the 11 health regions in Manitoba. Completion instructions were provided asking CEOs to distribute the survey (entire or by individual section) to the most appropriate person(s) within their region for completion. A copy of the survey is included as Appendix 1.

Once surveys were returned, responses were entered into an electronic database for organization and analysis. These results were reformatted and sent back to regions for validation before inclusion in the report. Throughout the process, attempts were made to identify inconsistencies in responses and clarify information with respondents. Regions were asked to provide samples of policies, protocols and/or practice guidelines as evidence where applicable. These policies are listed in Appendix 2.

Quantitative Analysis
Five years of hospital abstract data (April 1, 1999 – March 31, 2004) was analysed by Rolf Puchtinger, epidemiologist with the Diabetes and Chronic Diseases Unit at Manitoba Health & Healthy Living. This five-year period was selected for consistency and comparability between fiscal years. Manitoba implemented ICD-10 coding methodology on April 1, 2005 making comparisons with previous year's data difficult. Summary data is provided in the following sections while the complete analyses are included in Appendix 3.

The quantitative information will be presented in the next section to provide important regional context to inform the survey findings. This information includes volumes of cases by health region, referral patterns between health regions, age-gender demographics and hospital utilization patterns related to length of stay.

Utilization information within primary care, outpatient programs, home care and prevention clinics was generally unavailable and of questionable accuracy; it is not included in the quantitative analysis.

3.0 Quantitative Review of Stroke Care in Manitoba

3.1 Service Volumes

Five years of hospital abstract data was analysed to provide an understanding of the number of Manitobans treated for stroke care annually. Table 1 shows that during the period April 1, 1999 and March 31, 2004 there were nearly 14,000 discharges from Manitoba facilities with a diagnosis related to cerebrovascular disease (ICD-9 codes 430.xx through 438.xx – herein: 'stroke' diagnosis). The number of cases decreased slightly year over year. These separations[9, 10] represent 10,897 individual Manitobans who were discharged once with a stroke diagnosis from Manitoba facilities and 2,332 individuals with multiple stroke discharges within five years accounting for 5,434 discharges. The crude hospital separation rate for this five-year period was 24.3 per 10,000 insured Manitobans.

Non-Manitoba residents are also treated in Manitoba facilities. While Winnipeg is the major referral centre for areas of Northwestern Ontario, Nunavut and areas of the Northwest Territories, other Manitoba facilities also treat non-Manitoba residents, largely due to geographic proximity to provincial borders; ex: Saskatchewan residents in Dauphin (Parkland Regional Health Authority), Flin Flon (NOR-MAN Regional Health Authority) and Brandon. Non-resident hospitalizations are not included in the quantitative review. A secondary analysis of Winnipeg Regional Health Authority abstract data showed fewer than five per cent of separations for stroke-related admissions to Winnipeg hospitals were non-Manitoba residents.

Emergency visits are also not included. Emergency visit information is not abstracted within Manitoba. It is likely, however, that nearly all stroke patients presenting and treated in emergency result in hospitalization.

Table 1. Stroke Separations 1999/2000 – 2003/2004

Fiscal Year	Separations	Per cent of 5-Year Total	Crude Rate/10,000
1999/00	3,051	21.8	26.7
2000/01	2,941	21.0	25.6
2001/02	2,830	20.2	24.5
2002/03	2,606	18.6	22.5
2003/04	2,571	18.4	22.2
Total	13,999	100	24.3

Source: Manitoba Health Discharge Abstract Database

Stroke and stroke-related separations include a wide range of cerebrovascular conditions. Approximately one-third of hospital discharges were due to acute, but ill-defined, cerebrovascular disease. "Occlusion and stenosis of pre-cerebral arteries" and "transient cerebral ischemia" (TIA) are the next major diagnosis groups, each responsible for nearly one-fifth of all stroke and stroke-related hospitalizations. Table 2 presents the distribution of stroke cases by Most Responsible Diagnosis as identified by ICD9 Code.

[9] Separations include discharges, deaths and transfers from Manitoba facilities. Hospitalization data is grouped by Fiscal Year (April 1 – March 31) based on date of separation.

[10] Please note, for all data tables within this section of the report, separations include both day procedure cases and inpatient hospitalizations, which may make cross-jurisdictional (i.e. outside Manitoba) comparisons difficult.

Table 2. Stroke Separations by Diagnosis Group (1999/2000 – 2003/2004)

Most Responsible Diagnosis (ICD9 Group)	Separations	Per cent
Acute, but ill-defined, cerebrovascular disease	4,448	31.8
Occlusion and stenosis of pre-cerebral arteries	2,580	18.4
Transient cerebral ischemia	2,502	17.9
Occlusion of cerebral arteries	1,825	13.0
Intracerebral hemorrhage	775	5.5
Late effects of cerebrovascular disease	619	4.4
Other and ill-defined cerebrovascular disease	450	3.2
Other and unspecified intracranial hemorrhage	418	3.0
Subarachnoid hemorrhage	382	2.7

Source: Manitoba Health Discharge Abstract Database

3.2 Utilization – Demographics

Stroke affects both men and women. The sex distribution of stroke-related hospital separations was similar to the Manitoba population with 7,024 (50.2 percent) female and 6,975 (49.8 percent) male separations.

Generally, risk of stroke increases with age. In Manitoba, more than two-thirds of stroke discharges (67.1 percent) were to individuals 70+ years old. Age-specific stroke hospital separation rates increase from 0.9 per 10,000 in the age group younger than 40 years of age to 220.4 per 10,000 (2.2 percent) in the group 80 years of age and older.

Age Group	Separations	Per cent	Age-Specific Rate/10,000
younger than 40	291	2.1	0.9
40 to 59	1,874	13.4	12.2
60 to 69	2,452	17.5	56.5
70 to 79	4,472	32.0	124.9
80 to 89	4,070	29.1	217.6
90 and older	840	6.0	234.9

Source: Manitoba Health Discharge Abstract Database

Additional demographic data related to age and gender of stroke patients is included in Appendix 3.

Risk of death for stroke patients is considerable: 2,004 of the 13,999 hospital admissions (14.3 per cent) resulted in death while in hospital. The risk of not surviving a stroke-related hospital admission increases with age, with 10.0 per cent of stroke admissions resulting in death for patients younger than 80 years of age and 22.3 percent of stroke admissions resulting in death for the group 80 years of age and older. Risk of death associated with stroke hospitalization is slightly higher for females at 15.6 per cent of female stroke hospital separations compared to male deaths at 13.0 per cent of male stroke hospitalizations. This is consistent with information published on the Heart and Stroke Foundation of Manitoba website stating that 15 per cent of persons having a stroke die (www.heartandstroke.mb.ca).

3.3 *Utilization – In-Region and Out-of-Region Care*

Where do stroke patients come from?
Crude cerebrovascular disease hospital separation rates vary widely by regional health authority, with the lowest rates between about 18 and 23 separations per 10,000 insured individuals in Winnipeg, Brandon, Burntwood/Churchill, NOR-MAN and South Eastman health regions, intermediate rates between 29 and 32 separations/10,000 in Central, Interlake and North Eastman health regions and highest separation rates between 39 and 41 per 10,000 in Assiniboine and Parkland health regions. Adjusted rates (standardized to the 1999-2003 Manitoba Average Population) are also provided to account for the different age structures of regions.

Table 3. Separations by Regional Health Authority of Residence

Residential Regional Health Authority	Separations	Per cent	Crude Rate /10,000	Age Standardized to 1999-2003 Manitoba average		
				Adj. Rate /10,000	Lower Range	Upper Range
Winnipeg	6,712	47.9	20.5	20.1	19.7	20.6
Central	1,428	10.2	29.1	29.3	27.8	30.8
Assiniboine	1,405	10.0	39.6	28.1	26.6	29.6
Interlake	1,179	8.4	31.5	31.0	29.3	32.9
Parkland	873	6.2	40.9	30.8	28.8	32.9
South Eastman	629	4.5	22.9	29.4	27.1	31.8
North Eastman	572	4.1	29.1	33.0	30.3	35.9
Brandon	543	3.9	22.9	22.2	20.4	24.2
Burntwood/Churchill	431	3.1	18.9	48.4	42.9	54.3
NOR-MAN	227	1.6	18.1	28.2	24.6	32.3

Source: Manitoba Health Discharge Abstract Database

Where are stroke patients treated?
Since more advanced stroke diagnostic and treatment services are available at larger facilities within the larger urban regions and availability of specialist care is more likely within urban regions, one would expect a disproportionate amount of separations in Winnipeg. In fact, while less than 50 per cent of stroke separations are residents of the Winnipeg Regional Health Authority, over 60 per cent of separations are from facilities within the Winnipeg Regional Health Authority. All other regions have fewer cases separated from facilities within their region than cases of residents from their region. See Tables 3 and 4 for additional information.

Table 4. Regional Health Authority Separations by Region of Facility

Health Region	Total Separations	Per cent
Winnipeg	8,429	60.2
Assiniboine	1,155	8.3
Central	1,120	8.0
Interlake	781	5.6
Parkland	751	5.4
Brandon	484	3.5
South Eastman	477	3.4
North Eastman	332	2.4
Burntwood/Churchill	309	2.2
NOR-MAN	161	1.2

Source: Manitoba Health Discharge Abstract Database

Since more advanced stroke diagnostic and treatment services are available at larger facilities within the larger urban regions, one would expect a flow of patients from regions with smaller facilities to occur to regions with larger facilities. In fact, almost a quarter of stroke separations in Winnipeg (22.7 per cent) and Brandon (24.8 per cent) are patients whose health region of residence is another regional health authority (non-residents). Conversely, nearly one-half of the stroke separations associated with North Eastman (45.5 per cent) and Interlake (40.6 per cent) residents are treated in other regional health authorities, not surprising due to the proximity of the population centres of these regional health authorities to Winnipeg. However, the majority of strokes in Manitoba (82.7 percent) are discharged in the region of residence. Data is based on the period April 1, 1999 through March 31, 2004 and may not be reflective of current inflow-outflow patterns, especially in Brandon where significant enhancements to delivery of stroke services have occurred since 2004.

Table 5. Regional Health Authority Separations for Residents and Non-residents

	Same RHA separations	From other RHA		To other RHA	
		Separations	Per cent	Separations	Per cent
Winnipeg	6,518	1911	22.7	194	2.9
Assiniboine	1,074	81	7.0	331	23.6
Central	1,035	85	7.6	393	27.5
Parkland	706	45	6.0	167	19.1
Interlake	700	81	10.4	479	40.6
South Eastman	425	52	10.9	204	32.4
Brandon	364	120	24.8	179	33.0
North Eastman	312	20	6.0	260	45.5
Burntwood/Churchill	292	17	5.5	139	32.3
NOR-MAN	153	8	5.0	74	32.6

Source: Manitoba Health Discharge Abstract Database

Additional details of stroke care delivered out of the region (by health region) are included in the complete analysis in Appendix 3.

3.4 *Utilization – Length of Stay*

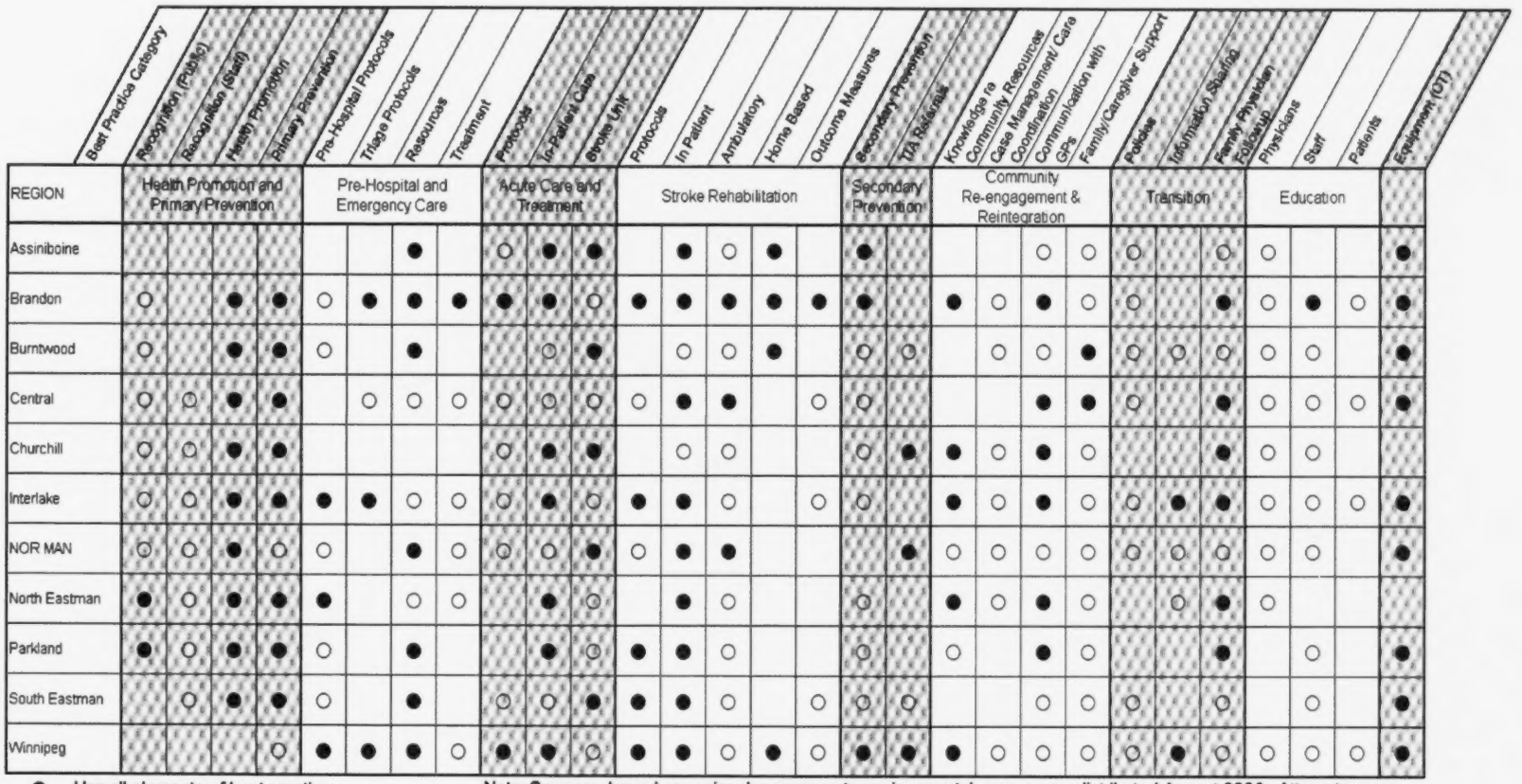
Length of stay profiles for stroke- and stroke-related hospitalizations vary by health region. Median lengths of stay range from a low of one (Burntwood) to a high of eight days (Churchill). However, caution should be exercised when reviewing hospitalization data from these regions due to the large number of separations (109) from nursing stations in Burntwood and small sample size (five cases) in Churchill. Excluding these two regions, median lengths of stay range from five (Winnipeg) to seven days (multiple regions). Very long lengths of stay are due to the presence of chronic and/or long-term care residents separated from facilities that also deliver acute care services.

Table 6. Length of Stay Profiles by Region of Facility

RHA of Service Delivery	Length of Stay (days)					Cases
	Min	25th percentile	Median	75th percentile	Max	Frequency
Winnipeg	0	1	5	18	3913	8,429
Assiniboine	1	3	7	19	896	1,155
Central	0	2	6	16.5	567	1,120
Interlake	1	2	7	18	194	781
Parkland	0	2	6	20	1934	751
Brandon	0	3	6	18	907	484
South Eastman	1	3	7	19	172	477
North Eastman	1	2	6	16.5	371	332
Burntwood	1	1	1	4	267	304
NOR-MAN	1	3	6	15	281	161
Churchill	2	4	8	11	1033	5

To follow are the results of the environmental scan to identify resources, equipment, practices, policies or protocols for delivery of care for stroke patients in Manitoba.

4.0 Summary of Environmental Scan Survey by Region



REGION	Health Promotion and Primary Prevention				Pre-Hospital and Emergency Care				Acute Care and Treatment			Stroke Rehabilitation					Secondary Prevention		Community Re-engagement & Reintegration				Transition			Education			
	Best Practice Category	Recognition (Public)	Recognition (Staff)	Health Promotion	Primary Prevention	Pre-Hospital Protocols	Triage Protocols	Resources	Treatment	Protocols	In-Patient Care	Stroke Unit	Protocols	In Patient	Ambulatory	Home Based	Outcome Measures	Secondary Prevention	TIA Referrals	Knowledge re Community Resources	Case Management/ Coordination	Communication with GPs	Family/Caregiver Support	Policies	Information Sharing	Family Physician Follow-up	Physicians	Staff	Patients	Equipment (OT)
Assiniboine							●		○	●	●		●	○	●		●				○	○	○		○	○			●
Brandon	○		●	●	○	●	●	●	●	●	○	●	●	●	●	●	●		●	○	●	○	○		●	○	●	○	●
Burntwood	○		●	●	○		●			○	●		○	○	●		○	○		○	○	●	○	○	○	○	○		●
Central	○	○	●	●		○	○	○	○	○	○	○	●	●		○	○				●	●	○		●	○	○	○	●
Churchill	○	○	●	●					○	●	●		○	○			○	●	●	○	●	○			●	○	○		
Interlake	○	○	●	●	●	●	○	○	○	●	○	●	●	○		○	○		●	○	●	○	○	●	●	○	○	○	●
NOR MAN	○	○	●	○	○		●	○	○	○	●	○	●	●				●	○	○	○	○	○	○	○	○	○		●
North Eastman	●	○	●	●	●		○	○		●	○		●	○			○		●	○	●	○		○	●	○			
Parkland	●	○	●	●	○		●			●	○	●	●	○			○		○		●	○			●		○		●
South Eastman		○	●	●	○		●		○	○	●	●	●	○		○	○	○			○	○	○		○		○		●
Winnipeg				○	●	●	●	○	●	●	○	●	●	○	●	○	●	●	●	○	○	○	○	●	○	○	○	○	●

● Has all elements of best practice

○ Contains some elements of best practic

Requires attention

Note: Summary based on regional responses to environmental scan survey distributed August 2006. Attempts were made to identify inconsistencies in responses, and clarify information with respondents. Regions were asked to provide samples of policies, protocols and/or practice guidelines as evidence where applicable.

5.0 Health Promotion and Primary Prevention

Stroke recognition is an important component of health promotion. Recognition of the warning signs of stroke and the appropriate actions to take is essential to improving stroke outcomes. Increased awareness by both the public and health care professionals of signs of stroke is a key element of a successful integrated stroke strategy.

It is through primary stroke prevention that the most significant reductions in stroke morbidity and mortality will be achieved. Identifying an individual's stroke risk factors allows the development of strategies to reduce the risk of stroke. Detecting and managing predisposing medical conditions, such as diabetes or hypertension, can prevent many strokes. Modifying behavioural risk factors, such as smoking or inactivity, can also prevent strokes.

5.1 Best Practice

The following guidelines represent best practice for stroke recognition and health promotion as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Increase and maintain awareness among the public and healthcare providers of the warning signs of stroke and the appropriate actions to take.
- Develop an optimal stroke prevention strategy in a timely manner for all individuals at high risk of stroke, all individuals with TIA and all stroke survivors. The strategy should include the optimal use of stroke prevention services, a plan for lifestyle modification, pharmacotherapy and a plan for effective communication between the client, primary care physician and stroke prevention services.

Important: The best practice guideline (above) makes reference to stroke prevention for "individuals with TIA and all stroke survivors." Secondary stroke prevention is not included within this section, but is included in its own section (Section 9) later in this report.

5.2 Key Findings

5.2.1 Public Awareness Programs

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response percentage
R1-1 In addition to efforts by the Heart and Stroke Foundation, the region has local public awareness programs for stroke recognition, including recognizing stroke symptoms, warning signs and the appropriate actions to take.		•		•		•		•	•			45
R1-2 The region prominently displays the warning signs of stroke and the appropriate actions to take in patient care areas (ex: emergency waiting areas).							•	•	•			27
R1-4 The region makes educational brochures on stroke recognition widely available to the public.		•	•	•	•		•	•	•			64

- Most regions partner with the Heart and Stroke Foundation for public awareness purposes.
- In addition to partnering with Heart and Stroke Foundation, many regions use a variety of media or other forums to create public awareness of the warning signs of stroke and the appropriate actions to take. For example:
  - Brandon partners with local television to broadcast information about signs of stroke.
  - North Eastman (Health Corner in local newspapers) and Parkland (Parkland Health Beat on CKDM Dauphin) use local media to promote stroke awareness.
  - NOR-MAN provides stroke education to major employers within their region, ex: Hudson Bay Mining and Smelting (HBM&S) in Flin Flon and Tolko in The Pas.
  - In South Eastman, the rehab unit provides the Heart and Stroke Foundation "Let's talk about stroke" info guide to patients and family of those admitted with a stroke.
  - Other forums used for creating public awareness of stroke include posters at wellness fairs and senior centres (Central), EMS sites (North Eastman) and PHC centres (North Eastman).
- Few regions prominently display the warning signs of stroke and the appropriate actions to take, in patient-care areas. While NOR-MAN and Parkland responded that they prominently display information in waiting rooms and hallways, other regions indicate that display of warning signs is done inconsistently, without specific signage or posters.
- Most regions make educational brochures on stroke widely available to the public.

5.2.2 Health Care Provider Awareness Programs

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response percentage
R1-2 The region prominently displays the warning signs of stroke and the appropriate actions to take in patient care areas (ex: emergency waiting areas).							•	•	•			27
R1-3 The region prominently displays the warning signs of stroke and the appropriate actions to take in staff areas (ex: staff rooms, eating areas).								•		•		18
R1-5 The region communicates with primary healthcare providers, such as family physicians, regarding stroke recognition information for their patients.				•	•	•						27

- Few regions display stroke awareness information in staff areas (ex: staff rooms, locker areas, cafeterias and eating spaces).
- Where stroke awareness information is posted in staff areas, it is done inconsistently.
- Few regions communicate directly with primary healthcare providers regarding stroke recognition. Central health region provides physician awareness through Medical and Critical Care Teams and Healthy Living, Interlake health region addresses stroke in the regional CDPI plan and NOR-MAN health region offers the Heart-to-Heart program in Acute Care.

5.2.3 Health Promotion
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response percentage
P1-1 The region engages in health promotion that informs the public about stroke risk factors and how to address or avoid them.		•	•	•	•	•	•	•	•	•		82

- Almost all regions engage in health promotion activities using a variety of media, settings and activities to inform the public and health care providers of stroke risk factors and risk reduction.
- Health promotion activities in the Assiniboine health region focus on healthy eating, physical activity and smoking cessation and are not disease/condition specific. This is also true for the Winnipeg Regional Health Authority.
- Regional partnerships with the Heart and Stroke Foundation of Manitoba (HSFM) for health promotion material and activities are common.
- Some examples of health promotion activities currently performed include:

Brandon	Partners with a local television station to broadcast information about the risk of stroke, signs of stroke and stroke-healthy lifestyles.
Burntwood	Integrates health promotion activities with chronic illness prevention activities.
Central	Partners with wellness fair, senior centres and public health offices.
Churchill	Communicates stroke risk factors to the public, and as part of the screening process for smoking cessation and *in motion* program activities.
Interlake	Informs the public through community-specific health promotion activities or mobile wellness screening activities. Provides blood pressure screening clinics in some communities, but is limited by staff availability and contractual issues.
NOR-MAN	Engages in health promotion activities for the public, not specific to stroke but included in lifestyle and health factors education.
North Eastman	Provides public education in many communities. Includes healthy lifestyles as Board End. Wellness program focuses on healthy nutrition, smoking cessation and physical activity.
Parkland	Chronic Disease Prevention Initiatives include community-led awareness activities promoting healthy lifestyles (ex: lower risk behaviour) for chronic disease including cardiovascular disease, diabetes, lung and kidney disease and cancer, although no specific messaging related to stroke. Community health workers provide clients with information on chronic diseases (including stroke) and organize preventive activities.
South Eastman	The region engages in health promotion activities to inform the public about stroke risk factors and how to avoid them, including: ➢ individualized health counseling (preventive) and group presentations; ➢ posters/displays/information available via Health Corners; ➢ co-ordination of Risk Factor and Complication Assessment Pilot Project in partnership with primary health care centres; and ➢ chronic Disease Prevention Initiative - regionally-run, community-driven initiative to decrease risk factors.

Winnipeg

Physical activity is promoted through Winnipeg *in motion* (see www.winnipeginmotion.ca) and through tobacco reduction activities (support for smoke-free policies, assistance for smoking cessation, promoting the provincial smokers helpline, enhancing the capacity of front-line health care providers through Brief Intervention Counseling training and promoting smoke-free homes on home visits). The Winnipeg health region is also participating in the Chronic Disease Prevention Initiative (CDPI) in Seven Oaks and Point Douglas areas - assisting the community through a community development approach to promote healthy nutrition, physical activity and smoke-free environments for better health. However, none of these are framed as stroke avoidance initiatives.

5.2.4 Primary Prevention

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response percentage
P1-2 In general, family physicians practicing within your region engage in primary prevention activities (ex: initiate discussions on stroke risk reduction and the importance of managing stroke risk factors with clients).		•	•	•	•	•		•	•	•	•	**90**
P1-3 The region engages in primary prevention activities involving other healthcare providers (ex: public health nurses, outreach workers, allied health) such as initiating discussions on stroke risk reduction and the importance of managing stroke risk factors with clients in a primary care setting.		•	•	•	•	•	•	•	•	•		**82**

- Family physicians and healthcare providers in almost all regions engage in primary prevention activities. It is unknown whether family physicians in Assiniboine or NOR-MAN health regions engage in primary prevention activities based on responses.
- Almost all regions engage in primary prevention activities consisting of more than one of or all of the following:
  - smoking cessation;
  - physical activity;
  - healthy nutrition; and
  - blood pressure awareness.

  See Appendix 9 - Table 7 for more details.
- The Winnipeg *in motion* baseline survey indicated that reasonably high levels of health care providers are currently discussing physical activity with their patients, particularly with middle-aged men. Care providers are doing a lot, but are they doing the right things and doing things right?

5.3 Opportunities

- Regions not currently partnering with the Heart and Stroke Foundation of Manitoba should do so to ensure that members of the public are at least able to recognize two signs or symptoms of stroke. The concept of "Time is Brain" must be emphasized and the public should be made aware to seek immediate medical attention.
  (See Appendix 5 - Recommendation 1.1)
- Awareness campaigns should be repeated frequently to increase and maintain awareness for both public and staff.
- Design a co-ordinated, province-wide strategy emphasizing "**stroke prevention**" by addressing lifestyle management issues (exercise, smoking, diet, weight, alcohol, stress management).
  (See Appendix 5 - Recommendation 3.1)
- Regions must take more of a lead role in ensuring primary care providers practicing within their regions have current primary stroke prevention information available at point of contact and ensure that stroke recognition signage is prominently displayed in both staff and patient care areas.

6.0 Pre-hospital & Emergency Care

Pre-hospital care includes treatment and protocols initiated by paramedics and other ambulance personnel prior to arrival to an acute care setting. Emergency care includes treatment and protocols initiated by emergency physicians, nurses and other emergency staff upon arrival to hospital.

6.1 Best Practice

The following guidelines represent best practice for pre-hospital care and emergency management as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Develop formal bypass or diversion protocols and transfer agreements, so that individuals meeting inclusion criteria for time-dependent therapy have the opportunity to receive them.
- Conduct a rapid assessment that includes use of the acute stroke protocol inclusion criteria and determine the patient destination using the acute stroke protocol, including the EMS destination policy.
- Establish protocols for the immediate clinical investigation of all strokes, including use of appropriate neuroimaging, and for access to and initiation of, time-dependent stroke therapy.

6.2 Key Findings

6.2.1 Pre-hospital Care Protocols, Procedures, Policies and Clinical Practice Guidelines

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
P2-1 EMS/ambulances have an acute stroke protocol (ex: stroke triage tool).		●	●			●		●		●	●	55
P2-2 There are formal bypass or diversion protocols between facilities for individuals meeting acute stroke protocol criteria (ex: a designated stroke center or receiving facility).		N/A			N/A						●	11
P2-3 There is a pre-notification protocol from EMS to the receiving emergency department when a stroke patient is in transit, including estimated time of arrival.		●	●			●	●	●	●	●	●	73
P2-4 There are formal policies/procedures describing the information required from paramedics on stroke patients (ex: time of symptom onset, etc).						●		●			●	27

- Winnipeg has formal bypass or diversion protocols between facilities for individuals meeting acute stroke protocol criteria. Brandon and Churchill are single facility regions and do not require bypass or diversion protocols.
- There are provincial protocols for pre-notification from EMS to emergency department (ED) and for prescribing information required from paramedics on stroke patients (Provincial Emergency Medical Treatment Guidelines). These protocols are used in some regions. Assiniboine is currently partnering with Brandon to develop pre-notification protocols within their region.
- Bypass protocols are not practical in rural areas with long response times.

6.2.2 Emergency Protocols, Procedures, Policies and Clinical Practice Guidelines
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-1 Emergency departments have a formal stroke triage protocol.		●				●					●	27
E1-2 Emergency departments conduct a baseline stroke assessment using a standardized scale.		●		●		●					●	36
E1-3 What CTAS level is assigned to acute stroke patients?	1 or 2	1 or 2	1	2		2	2		2	2	1	-
E1-4 Emergency departments have a protocol for TIA recognition.				●								9
E1-5 Emergency departments have formal procedures (ex: care map, algorithms or clinical practice guidelines) for stroke patients.		●				●					●	27
E1-6 Emergency departments have a triage protocol for determining appropriateness for and administration of tPA.		●				●					●	27
E1-7 Emergency departments have protocols for immediate clinical investigation of all strokes.		●				●					●	27

- Three regions have ED protocols for triaging, investigating and caring for stroke patients. The protocols are not standardized between or even within regions. In Winnipeg, two different protocols are being used - one for Health Sciences Centre and St. Boniface General Hospital (primary stroke centres) and another for the community hospitals.
- CTAS levels assigned to acute stroke patients vary by region, but most respondents indicated assignment of CTAS level 2, consistent with CTAS guidelines.
- Various standardized stroke assessment scales are used, including NIHSS (Brandon, South Eastman and Winnipeg), Canadian Neurological Scale (Central) and Glasgow Coma Scale (Interlake).
- Only one region (Central) has a protocol for TIA recognition and indicates that it is not used consistently.
- Protocols for appropriateness and administration of tPA are available in Brandon, Interlake and Winnipeg.
- There are some informal protocols regarding referral and transfer of patients. In NOR-MAN, attempts are made to transfer patients to tertiary care centres in Winnipeg.

6.2.3 *Neurological Services (including tPA)*

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-10 Emergency department(s) in the region have access to a neurologist.	●	●	●				●	●	●	●	●	73

Access to Neurologist	Location of Neurologist	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg
24 Hour On-Call Access to Neurologist	Winnipeg	●		●	●			●	●	●	●	●
	Brandon	●	●							●		
On-Site access to Neurologist												●

- Most regions have timely access to neurological services by phone 24 hours a day (from Brandon or Winnipeg). Average response times are estimated to be 15 minutes, though the longest waits range from 30 minutes to four hours and there are times when neurologists are unavailable.
- Churchill and Interlake indicated that they have no access to a neurologist.

6.2.4 *Regional Emergency CT Scans*

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-9 Emergency department(s) in the region have access to emergency CT scans.	●	●	●	●		●	●		●	●	●	82

- Emergency departments in most regions have access to emergency CT scans. Churchill and North Eastman indicate a lack of access to emergency CT scans.
- Access to emergency CT scans varies from seven hours to 24 hours per day.
- An estimate of timeliness of emergency CT scans varies from an average of 15 minutes to "less than 24 hours".
- Central health region indicates that access to emergency CT scans can be inconsistent and contingent on the availability of a radiologist to read and interpret the images.
- See Appendix 7 for map of CT availability in Manitoba indicating location of CT scanners with emergency coverage areas (radius 75 kilometers).

See Appendix 9 -Table 8 for more details.

6.2.5 *Other Diagnostic Services*

- All regions have emergency access to ECG.
- Few regions have access to other advanced diagnostic resources, including MRI and radiologists.

See Appendix 9 - Table 9 for more details.

6.2.6 *Specialized Staff Resources*

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-8 Emergency departments use a stroke team.		•									•	18
E1-21 Care plans are developed and documented for all stroke patients while in Emergency.		•		•		•	•					36
E1-22 Care plans are developed using a multi-disciplinary team approach.		•		•		•	•	•				45

- Emergency departments in Brandon and Winnipeg use a stroke team consisting of emergency physicians, nurses (including a stroke nurse at St. Boniface General Hospital), neurologist (on call in Brandon), SLP (on consult) and ICU (Brandon only).
- In some regions, emergency health care providers have specific training in the care of stroke patients including how stroke affects patient behaviour, current best practices for stroke, regional policies on stroke and stroke care maps.
- In regions where care plans are developed in emergency departments, they are generally developed using a multi-disciplinary team. Composition of the teams varies by region.
- The pharmaceutical companies have been instrumental in sponsoring and facilitating education sessions for triage nurses and emergency physicians in the province.

6.3 *Opportunities*

Please note that there are no recommendations from the Canadian Best Practice Recommendations for Stroke Care (2006) applicable to this section.

- It may be instructive or helpful to have information available as an overview on rural EMS generally.
- First responders in Winnipeg have been trained in stroke recognition (Cincinnati Scale) and appropriate actions to take. Consistent stroke recognition training for EMS personnel should occur in all regions.
- Timely treatment is as essential for stroke as for myocardial infarction. Regions should be encouraged to assign stroke patients to Triage Level 1 on the Canadian Triage Acuity Scale (CTAS) to ensure proposed timelines for acute treatment can be accomplished.
  (See Appendix 5 - Recommendation 4.4)
  (See Appendix 6 - Canadian E.D. Triage and Acuity Scale)
- Central health region is the only region with a TIA protocol. This protocol should be assessed for implementation in all regions.
- Regions neighbouring Winnipeg or Brandon should investigate the feasibility of implementing care guidelines where stroke patients receive emergent time-dependent treatment (ex: tPA) in their facility, following which the patient is transferred to a stroke centre in Brandon or Winnipeg.

- Investigate the creation of a virtual stroke centre with a radiologist and neurologist available 24/7 to help regions determine appropriateness for tPA. Supply of this service could be shared between Winnipeg and Brandon.
- Resources to support 24/7 CT scans are not available in most regions. Support from Brandon and Winnipeg is already in place, but used inconsistently. More formal agreements should be put in place to ensure timely assessment of acute stroke patients.
- During 2006, the Heart & Stroke Foundation of Manitoba and various pharmaceutical companies conducted training sessions on stroke for health care providers. The regions should leverage these resources and encourage health care providers to attend.

7.0 Acute Care & Treatment

Described by the Canadian Stroke Strategy in the Best Practices & Standards Working Group Environmental Scan Report (2003) as "the first seven days following a stroke", acute care includes the ongoing assessment, treatment, evaluation and management of stroke patients within a hospital setting.

7.1 Best Practice

The following guideline represents best practice for acute stroke treatment as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Manage individuals with acute stroke using the principles of organized stroke care, including management in a unit with specially trained staff, with the goals of preventing complications, ensuring early mobilization and rehabilitation and improving outcomes.

7.2 Key Findings

7.2.1 Policies, Protocols and Guidelines

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
A1-1 There are formal procedures/care guides for managing acute stroke patient care.		•		•		•	•				•	45
A1-4 Guidelines have been influenced by one (or more) of Royal College of Physicians, Scottish Intercollegiate Guideline Network, American Stroke Association or other.	•	•		•		•					•	45
A1-5 Baseline stroke assessments are done using standardized scales and tools.		•		•	•	•					•	45
A1-12 Assessing stroke patients in an acute setting is done using a standardized outcome measurement tool (ex: FIM).		•				•					•	27

- Five health regions (Brandon, Central, Interlake, NOR-MAN and Winnipeg) use formal procedures such as CVA protocols, stroke care maps and/or standard care plans for managing acute stroke patient care. The use of policies, protocols and guidelines for stroke in Winnipeg depends on the facility where the patient presents. There are no regional policies.
- Guidelines that have influenced the organization of stroke care include American Stroke Association and the Heart & Stroke Foundation of Ontario Best Practice Guidelines.
- Five health regions perform baseline stroke assessments in an acute care setting using standardized scales and tools.
- Brandon uses standardized tools such as the Barthel Index, SMMSE, Chedoke McMaster and Berg Balance to perform baseline assessments.
- The survey did not question the regions on the timeliness of assessments, but based on discussions with some respondents, baseline assessments are done as early as day one and up to two weeks after admission.

7.2.2 Acute Care (Stroke Unit)

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
A1-7 The region has beds designated for acute care.	●	●	●	●	●	●	●	●	●	●	●	100
A1-8 The region has its own dedicated stroke unit(s).												0
A1-11 The region is affiliated with/refers to a dedicated stroke unit in another region.	●	N/A	●		●		●			●	N/A	56

- All regions have designated beds for acute care, but none have a dedicated stroke unit. Brandon does have 12 beds unofficially designated for stroke care and planning is underway to open an acute stroke unit in Winnipeg in 2007.
- While there are no dedicated stroke units within the province, some regions perceive an affiliation with or referral pattern to a dedicated stroke unit in other regions.
- NOR-MAN health region indicates that patients from Manitoba are referred to the Health Sciences Centre in Winnipeg, while stroke patients from Saskatchewan are referred to Saskatoon.

For additional details, see Appendix 9 -Table 10.

7.2.3 Inpatient Care

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
A1-2 Acute care areas have access to neurological services as needed.	●	●			●	●		●	●	●	●	73
A1-3 Acute care areas have access to neurosurgical services as needed.	●	●			●	●		●	●	●	●	73
A1-9 Assessing stroke patients in an acute setting uses a co-ordinated multi-disciplinary team approach.	●	●	●	●	●	●	●	●	●		●	91
A1-23 Care plans are developed and documented for all stroke patients on admission to acute care.	●	●	●	●	●	●	●	●	●	●	●	100
A1-24 Care plans are developed using a multi-disciplinary team approach.	●	●	●	●	●	●	●	●	●	●	●	100

- All regions indicated neurological and neurosurgical services are available from Brandon and/or Winnipeg by phone or through referral except for NOR-MAN, Burntwood and Central health regions.
- All regions use multidisciplinary teams to assess and develop care plans for stroke patients in an acute setting.
- Team composition for assessment and care planning varies somewhat between health regions.

7.2.4 Diagnostic Services

- All regions have acute care access to ECG.
- Few regions have access to other advanced diagnostic resources including MRI and radiologists.

For additional details, see Appendix 9 - Table 11.

7.3 Opportunities

- An acute stroke unit (ASU) is currently being planned for Health Sciences Centre in Winnipeg. When available, ensure that appropriate referral processes are in place for all patients within Manitoba to be transferred to an acute stroke unit.
  (See Appendix 5 - Recommendation 4.1).
- Ensure clear repatriation agreements are in place for referral of patients back to their region/area of residence for those patients not appropriate for the ASU, no longer requiring admission to an ASU or requiring intensive rehabilitation or other services available in their region of residence.
- Adopt acute treatment guidelines from the Canadian Stroke Strategy and develop an implementation plan for Manitoba.
  (See Appendix 5 - Recommendations 4.2 - 4.8)

8.0 Stroke Rehabilitation

Stroke rehabilitation focuses on improving the abilities of the stroke survivor to facilitate independence and social integration. While rehabilitation begins concurrently with acute care and treatment, rehabilitation often extends well beyond the acute care phase (ex: beyond the first seven days).

8.1 Best Practice

The following guidelines represent best practice for rehabilitation management as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Evaluate the rehabilitation potential of each client and include a complete assessment conducted by a stroke rehabilitation team. Develop a comprehensive rehabilitation plan for each client that reflects the severity of the stroke and the needs and goals of the stroke survivor.
- Ensure that access to the appropriate intensity of rehabilitation services is available to stroke survivors throughout the continuum of care.
- Assess the ability of the family and caregiver to support a stroke recovery process. Develop a strategy that includes an educational component to address caregiver burden.
- Discharge stroke survivors from rehabilitation units in a timely manner, once realistic goals have been achieved and intensive inpatient rehabilitation is no longer required.

8.2 Key Findings

8.2.1 Protocols, Procedures, Policies and Clinical Practice Guidelines

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-1 The region has formal policies/procedures for assessing stroke survivors for rehabilitation potential.		●		●		●			●	●	●	55
R2-2 The region has formal policies/procedures for developing rehabilitation plans for each stroke client (inpatient/outpatient/home-based).		●				●	●		●	●	●	55

- Most regions have formal policies for assessing a patient's potential for rehabilitation or for admission into rehabilitation, though a single standard does not exist. In the rural regions, assessment may include input from physiotherapists and occupational therapists.
- Most health regions have formal policies for developing a rehabilitation plan for each stroke client. Examples include the Stroke Care Map (Interlake), the Standard Care Plan (NOR-MAN) and Therapy Goal Setting (Parkland).

8.2.2 *Inpatient Rehabilitation Services*

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-5 The region provides inpatient rehabilitation services.	●	●		●		●	●	●	●	●	●	82
R2-6 The region has beds designated for rehabilitation.	●	●	N/A	●					●	●	●	60
R2-7 Inpatient rehabilitation is provided by a multi-disciplinary team.	●	●	N/A	●	N/A	●	●	●	●	●	●	100
R2-10 The region refers patients to inpatient rehabilitation services in another region.	●		●		●	●	●	●	●	●		73

- All regions either provide inpatient rehabilitation services and/or refer patients to Brandon or Winnipeg for inpatient rehabilitation services. In NOR-MAN, patients from Saskatchewan are referred to Saskatoon.
- All regions that provide inpatient rehabilitation services use a multi-disciplinary team.

For details on inpatient rehabilitation services, see Appendix 9 - Table 12.

8.2.3 *Outpatient Rehabilitation Services*

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-11 The region has access to outpatient rehabilitation services in the region.	●	●	●	●	●		●	●	●	●	●	92
R2-12 Outpatient rehabilitation is provided by a multi-disciplinary team.		●		●			●					27
R2-15 The region refers patients to outpatient rehabilitation services in another region.					●	●		●	●	●	●	64

- All regions either provide outpatient rehabilitation services and/or refer patients to Winnipeg for outpatient rehabilitation services. Some specific referral patterns include:
  - Interlake refers stroke patients to Winnipeg for outpatient speech and swallowing assessments and for other services as available; and
  - South Eastman refers stroke patients to constrained induced program – St. Boniface General Hospital, Winnipeg or Speech/Language Pathologist - Communications Disorders Department / Video Fluoroscopy – Health Sciences Centre, Winnipeg.
- Outpatient rehabilitation services in some rural areas are limited to services provided by Community Therapy Services (Assiniboine) or by the availability of physiotherapists (Burntwood).
- Outpatient rehabilitation is provided much more informally than inpatient rehabilitation services.
- Few regions use a multi-disciplinary outpatient rehabilitation team.

For details on outpatient rehabilitation services, see Appendix 9 - Table 13.

8.2.4 Home-Based Rehabilitation Services

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-16 The region has access to home-based rehabilitation services in the region.	•	•	•								•	36
R2-17 Home-based rehabilitation is provided by a multi-disciplinary team.	•	•	•		N/A						•	40

- Few regions have access to home-based rehabilitation services in the region.
- Regions that provide home-based rehabilitation services in the region use a multi-disciplinary team.
- Winnipeg has piloted the services of a dedicated community stroke care services team for stroke patients at Riverview Health Centre. Considerable support, care and rehabilitation is provided to the client in the community through the staff of the community stroke care service (case co-ordination, occupational therapy, speech-language pathology, physiotherapy, use of rehabilitation assistants to support the work of the therapists and more time and opportunity for clients to work on their goals). Areas of rehabilitation include:
  - assessment and intervention directed at improving client communication;
  - safe swallowing;
  - mobility;
  - independence in self-care;
  - home management;
  - return to work;
  - re-engagement in social and leisure activities and interests; and
  - adaptation to limitations from the stroke, etc.

  Both remediation and compensation approaches are used. Clients are seen in their home environment where this is the most appropriate setting to address client goals and issues. Clients continue to have access to outpatient services (rehabilitation at a hospital or clinic setting), day hospital program or alternate service where these options are the most appropriate rehabilitation resources for the given individual client situation.

  An evaluation of the pilot was done and permanent funding is now required to expand and continue the services.

For details on home-based rehabilitation services, see Appendix 9 - Table 14.

8.2.5 Outcome Measures

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-3 The region uses standardized outcome measures for rehabilitation (ex: FIM).		●				●				●	●	36

- Few regions use standardized outcome measures for rehabilitation.
- Tools used include:
  - Barthel Index (Brandon)
  - SMMSE (Brandon)
  - Chedoke McMaster (Brandon and Winnipeg)
  - FIM (Winnipeg and South Eastman)
  - COPM (Winnipeg)
  - Berg Balance Scale (South Eastman)
  - OSOT Visual Perception Test (South Eastman)
  - COGNISTAT cognitive competency test (South Eastman)
  - FOLSTEIN – MMSE (South Eastman)

8.2.6 Rehabilitation Reporting

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-4 The region participates in CIHI National Rehabilitation Reporting.		●		●								18

- Only Brandon and Central currently participate in CIHI National Rehabilitation Reporting. South Eastman participation is pending funding approval for software.
- Key rehabilitation staff from Winnipeg received training and the health region has established an implementation team. Plans are underway for reporting to start April 1, 2007.
- Some regions (Assiniboine and Interlake) indicated a lack of awareness of CIHI National Rehabilitation Reporting.

8.3 *Opportunities*

- Ensure that an initial stroke rehabilitation assessment is done within 24 hours of patient admission.
  (See Appendix 5 - Recommendation 5.1a)
- Manitoba Health to support implementation of CIHI Rehabilitation Reporting throughout the province (Manitoba Health is already involved in this process). This will ensure the implementation of a standardized assessment tool (FIM) throughout the province.
  (See Appendix 5 - Recommendation 5.1c)
- Regions providing inpatient stroke rehabilitation should investigate the implementation of the recommendations from the Canadian Stroke Strategy for inpatient rehabilitation care.
  (See Appendix 5 - Recommendations 5.2 – 5.6)
- Regions that do not provide stroke rehabilitation should refer acute stroke patients to an inpatient stroke rehabilitation facility.

9.0 Secondary Prevention

Secondary prevention of stroke is an individually based, clinical approach to reducing the risk of events in persons who are experiencing symptoms that place them at high risk of a stroke or have already experienced a transient ischemic attack (TIA) or mild non-disabling stroke. Prevention strategies may include medication, surgery and support in making lifestyle changes.[11]

9.1 Best Practice

The following guidelines represent best practice for secondary stroke prevention as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Educate individuals at high risk of stroke, those who have experienced a TIA or stroke, family members and healthcare providers about stroke prevention, relevant information resources and how to gain access to them.

9.2 Key Findings

9.2.1 Secondary Prevention

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
P1-4 The region has hospital-based secondary prevention clinic(s) ex: vascular clinics, stroke prevention clinics, diabetes clinics, hypertension clinics or others.	•		•		•						•	36
P1-5 The region refers to hospital-based secondary prevention clinics in other regions.	•	•	•	•	•	•				•		64
P1-6 The region has community-based secondary prevention clinic(s) ex: vascular clinics, stroke prevention clinics, diabetes clinics, hypertension clinics or others.	•	•	•	•	•			•	•	•	•	82
P1-7 The region refers to community-based secondary prevention clinics in other regions.	•			•				•				27
P1-8 The region provides communication to healthcare providers, such as family physicians, nurse practitioners, emergency departments regarding availability of and access to secondary prevention clinics.	•	•						•			•	36

- All but three regions provide hospital-based secondary prevention clinics and/or refer to hospital-based secondary prevention clinics in other regions. Regions that refer to hospital-based secondary prevention clinics in Winnipeg include:
  - Burntwood (Stroke Prevention Clinic at Health Sciences Centre);
  - Central;
  - Churchill;

[11] *Coordinated Stroke Strategy Website*

- Interlake (refer speech/swallowing assessments, rehab assessments to Deer Lodge Centre in Winnipeg; other WRHA facilities have been accessed if available); and
- South Eastman (Stroke Prevention Clinic at St. Boniface General Hospital, although this not a standard practice).

➢ All but two regions provide community-based secondary prevention clinics and/or refer to community-based secondary prevention clinics in other regions. The following are specific referral patterns for secondary prevention clinics:
- Central (occasionally);
- Assiniboine (occasionally); and
- Brandon (one neurologist refers patients to stroke prevention clinic in Winnipeg).

➢ Stroke prevention clinics are provided by two regions (NOR-MAN - through a visiting neurologist and Winnipeg) and through referrals from five health regions (Brandon, Burntwood, Churchill, NOR-MAN and South Eastman).

➢ In Winnipeg, urgent referrals to the stroke prevention clinics are seen within 24 hours. As a result of the increase in stroke awareness, an increase in referrals is being experienced and the wait time has increased significantly due to a shortage of support/follow-up resources. Currently the wait time for services can be longer than 30 days. This is not best practice and the region is investigating the expansion of the stroke prevention service.
The Winnipeg Regional Health Authority vascular clinics at the Grace General Hospital and Health Sciences Centre also provide secondary stroke prevention services to persons experiencing a TIA or at risk for stroke.
The region also has various diabetes clinics with services from endocrinologists and multi-disciplinary teams.

➢ Brandon is currently exploring the possibility of a stroke prevention clinic. Prairie Health Matters pamphlets are distributed to all patients admitted with TIA and stroke. However, the patients must take the initiative to call or attend the clinics. Series offered include "heart/stroke" smart cooking classes, blood pressure classes, etc. Primary health care providers are also requested to supply patients with these pamphlets.

➢ In Assiniboine health region, physician turn-over in the region is 30-40 per cent each year. A physician orientation binder is given to all new physicians and regional practices are shared with the medical advisory committee.

➢ In Burntwood, patients are referred to an internal medicine consultation clinic for risk factor assessment and management for various vascular diseases, including stroke prevention.

➢ In Central, the critical care team and medical team communicate current information to sites (hospitals) and medical clinics in the region. At the annual general meeting in October 2005, an information poster on stroke prevention and handouts were available and have been displayed throughout the region at wellness fairs and seniors centres this year.

➢ In Interlake, the delivery and co-ordination of stroke prevention services within the region is an impossible question to generalize about with 50+ primary care physicians each developing their own referral patterns. The Interlake Regional Health Authority does not provide centralized referral services. In addition, rural physicians tend to be transient so there would not necessarily be consistency from year to year.

For more details, see Appendix 9 - Tables 15 and 16.

9.2.2 TIA (Transient Ischemic Attack)

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
P1-9 The region communicates with primary healthcare providers, such as family physicians, regarding the need for referral of all TIA patients for stroke prevention services.					•		•				•	27
P1-10 Patients with TIAs are referred to stroke prevention clinics or a neurologist for urgent investigation and development of a care plan.			•		•		•			•	•	45

- Churchill communicates with primary healthcare providers, such as family physicians, regarding the need for referral of all TIA patients for stroke prevention services. Patients with TIAs are referred to stroke prevention clinics or a neurologist at Health Sciences Centre in Winnipeg for urgent investigation and development of a care plan.
- In Interlake, since family practice physicians provide emergency services, TIA awareness is generally managed within the medical group. The regional health authority is not involved in this process.
- In NOR-MAN, the region communicates with primary healthcare providers, such as family physicians, regarding the need for referral of all TIA patients for stroke prevention services. Patients with TIAs are referred to the visiting neurologist in Flin Flon for urgent investigation and development of a care plan.
- Communicating with primary healthcare providers, such as family physicians, regarding the need for referral of all TIA patients for stroke prevention services is inconsistent among regions and can be challenging in rural areas.

For more details, see Appendix 9 -Table 17.

9.3 Opportunities

- A guideline for TIA recognition and appropriate treatment options should be developed and implemented for the province.
- There is a need for a comprehensive database of prevention services/clinics for Manitoba. Physicians do not have access to information on ambulatory clinics that would be appropriate for their patients. The Manitoba Provincial Stroke Framework Advisory Committee should investigate the creation of such an information database.

10.0 Community Re-engagement and Reintegration

Community re-engagement focuses on processes and supports that maximize the likelihood of stroke survivors feeling empowered and achieving their personal goals.[12] This includes evolving care plans and regular follow-up assessments by health care professionals.

10.1 Best Practice

The following guidelines represent best practice for community re-engagement and reintegration as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Assist the stroke survivor and family to develop and implement an evolving care plan by conducting six-week, three-month and one-year follow-up assessments of all aspects of health status, community participation and links to prevention services.
- Support caregivers in balancing personal needs and caregiving responsibilities by providing community programs, respite care and educational opportunities and by linking caregivers to these programs.
- Assist stroke survivors to maintain, enhance and develop appropriate social support.
- Create strategies to enable healthcare professionals and caregivers in community and long-term care settings to develop stroke care expertise to support stroke survivors in achieving their goals.

10.2 Key Findings

10.2.1 Case Management and Care Co-ordination

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-18 The region has case management/transition services for stroke patients (in emergency).			•			•						18
E1-25 Follow-up assessments of health status, community participation and links to prevention services are performed regularly.					•		•	•				27
A1-19 The region has case management/transition services for stroke patients (in acute care).			•							•	•	27
A1-28 Follow-up assessments of health status, community participation and links to prevention services are performed regularly.					•	•		•				27
R2-25 The region has case management/transition services for stroke patients (in rehabilitation).		•	N/A			•					•	30
R2-31 Follow-up assessments of health status, community participation and links to prevention services are performed regularly.		•	N/A									10

- Few regions use case management for community re-engagement.
- Case management and transition is performed inconsistently, with transition management occurring in only certain phases in certain regions. Where case management is used, it is often informal.

[12] *Heart and Stroke Foundation of Ontario, Best Practice Guideline for Community Re-engagement*

- Follow-up assessments are performed inconsistently across the province. Follow-ups are generally performed by home care staff, at medical clinics or by primary health care practitioners and not co-ordinated by the regions.
- In Central health region, home care is co-ordinated regionally and is excellent at providing support to stroke victims. They maintain regular contact with the physician to ensure patient needs are met.

10.2.2 Community Agencies
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
A1-27 Acute care providers have up-to-date knowledge of available community resources for stroke survivors.		•			•	•					•	36
R2-30 Rehabilitation providers have up-to-date knowledge of available community resources for stroke survivors.		•			N/A		•		•			30

- Many regions identified that a number of community resources are available to stroke survivors within their region or neighbouring regions, but that acute care and rehabilitation providers do not have up-to-date knowledge of these resources.
- Brandon and Interlake indicate that they have processes to update provider knowledge of the community resources available to stroke survivors, including:
  - Interlake updates community resource information bi-annually; and
  - Brandon providers distribute "Let's talk about stroke" manual to survivors and care-givers. Information is also made available through the Community Partners Information.
- All health services in Churchill are located within the regional centre; therefore, acute care providers have ready access to community resources.

10.2.3 Communication with Family Physicians
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-20 Emergency department staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.		•		•	•	•		•	•			55
A1-21 Acute care staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.	•	•	•	•	•	•	•	•	•			82
R2-27 Rehabilitation centre staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.		•	N/A	•	N/A				•	•		45

- The primary healthcare provider is identified at some phase of care.
- Acute care appears to be the most common phase to identify and develop a plan to inform the primary health care provider.
- In rural areas, the family practitioners provide the emergency and acute care and are therefore identified and informed throughout all phases of care.
- It is standard practice for copies of discharge summaries to be sent to a patient's family physician when identified; however, this can't always be done in a timely fashion.

10.2.4 Care Giver Support
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-19 When planning a stroke patient's transfer from emergency, a formal meeting or conference is held with the client and family.			●	●								18
A1-20 When planning a stroke patient's transfer from acute care units, a formal meeting or conference is held with the client and family.	●		●	●	●	●	●	●	●		●	82
A1-29 The region provides respite for caregivers (acute).	●		●	●	●	●	●	●	●		●	82
R2-26 When planning a stroke patient's discharge from a rehabilitation setting, a formal meeting is held with the client and family.	●	●	N/A	●	N/A				●	●	●	67
R2-32 The region provides respite for caregivers (rehabilitation).	●	●	●	●			●	●	●	●	●	82

- For all regions, formal meetings or conferences are held with the client and family upon transfer from at least one phase of care. It is most common for such formal meetings or conferences to occur upon transfer from acute care settings. Generally, formal family conferences or meetings do not occur within emergency.
- Almost all health regions provide respite for caregivers in both acute care and rehabilitation settings, although some regions indicate that availability is inconsistent.

For more information on community referral practices, see Appendix 8.

10.3 Opportunities

- Follow up of stroke survivors is lacking in the province. The establishment of a stroke register to allow regions to follow-up and evaluate stroke survivors in the community should be investigated. (See Appendix 5 - Recommendation 6.1)
- Information and education should be provided for all stroke patients and their families and caregivers at all stages of care across the continuum.
  (See Appendix 5 - Recommendation 2)

11.0 Transition Management

The transition process determines the most appropriate next step in care and manages both the transfer in responsibility for care and the physical transfer of the stroke survivor. Transitions may be made within or between facilities, or from a facility to home, chronic care or a long-term care setting. The need to manage transition activities also exists between regions and jurisdictions when services are not available locally. Optimal management of the transition process can reduce duration of hospital stays, facilitate rehabilitation and speed recovery.

11.1 Best Practice

The following guidelines represent best practice for transition management as per the *Best Practice Guidelines for Stroke Care* (Heart and Stroke Foundation of Ontario, 2003):

- Identify and confirm the primary healthcare provider before the stroke survivor is discharged from acute care and keep this individual informed throughout all phases of care.
- Develop and follow protocols at each transition point across the continuum of care to ensure appropriate and timely access to services.
- Manage transitions with an interdisciplinary team, whose members all use standardized information and processes, to ensure that relevant documentation is transferred with the client to facilitate continuity of clinical and case management.
- Provide opportunities for ongoing access to rehabilitation and community services for stroke survivors and their families, during all phases of care.

11.2 Key Findings

11.2.1 Transition Management Between Settings

Percentage of Regions with Formal Policies/Protocols for Transition Management of Stroke Patients

Transition From / To	Emergency	Acute Care	Rehabilitation	Home-Based or Community-Based
Emergency	27	27	27	9
Acute Care		18	45	18
Rehabilitation				
Home-based or Community-based				

Transition Management from Emergency to Other Care Settings
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-13 The region has formal policies/protocols for transition management of stroke patients from emergency to acute care.		●		●		●				●		36
E1-14 The region has formal policies/protocols for transition management of stroke patients from emergency to rehabilitation.				●		●				●		27
E1-15 The region has formal policies/protocols for transition management of stroke patients from emergency to home- or community-based care (ex: secondary prevention clinics).						●				●		18
E1-16 The region has formal relocation agreements between facilities for stroke patients.	●						●				●	27

From Acute Care to Other Care Setting
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
A1-14 The region has formal policies/protocols for transition management between acute care units.			●								●	18
A1-15 The region has formal policies/protocols for transition management of stroke patients from acute care to rehabilitation.	●	●	●							●	●	45
A1-16 The region has formal policies/protocols for transition management of stroke patients from acute care to home- or community-based care (ex: secondary prevention clinics).	●									●	●	27
A1-17 The region has formal relocation agreements between facilities for stroke patients.										●	●	18

From Rehabilitation to Other Care Settings

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R2-20 The region has formal policies/protocols for transition management from rehabilitation to emergency or acute care stroke units.		•	N/A		N/A					•	•	33
R2-21 The region has formal policies/protocols for transition management between rehabilitation centres.			N/A		N/A							0
R2-22 The region has formal policies/protocols for transition management from rehabilitation centres to home- or community-based stroke care (ex: secondary prevention clinics).			N/A		N/A							0
R2-23 The region has formal relocation agreements between facilities for stroke patients.			N/A		N/A							0

- Overall, few regions have protocols for transition management of stroke patients between settings.
- Interlake uses a Stroke Care Map that directs transition from emergency to acute care to rehabilitation. Central uses an Acute Care Stroke Map (CVA protocol) to manage transitions from emergency to other settings.
- NOR-MAN refers patients from emergency care to Winnipeg or Saskatoon (Saskatchewan residents only).
- It is most common to have protocols for transition management of stroke patients from acute care settings to rehabilitation settings. Burntwood and Winnipeg use the same protocol for managing transition from acute care to rehabilitation. In locations where acute care and rehabilitation are at the same site (ex: Brandon), relocation and transfer policies may not be applicable.
- South Eastman and Winnipeg have policies and procedures for managing the transition of stroke patients from acute care to home-based or community-based care. Case management is a formal procedure in Winnipeg, but less formal in South Eastman.
- Only a few regions have formal protocols for transition management of stroke patients from emergency to other settings; however, generally emergency and acute care services are co-located making formal protocols less applicable.
- Few regions have policies for transition management of stroke patients between acute care units.
- The Winnipeg region has an interim repatriation policy to community hospitals for acute stroke patients presenting to the stroke centres that neither qualify for tPA nor require tertiary care.

11.2.2 Chart Transfer
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-17 The region uses standardized information and processes between sites for managing transitions (emergency).		N/A				•					•	20
A1-18 The region uses standardized information and processes between sites for managing transitions (acute).						•	•	•			•	36
R2-24 The region uses standardized information and processes between sites for managing transitions (rehabilitation).			•		N/A	•					•	30

- Standardized information and processes are generally lacking between sites and between health regions.
- Regions tend to have different standards for transfer forms.

11.2.3 Follow-up
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-20 Emergency department staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.		•		•	•	•		•	•			55
A1-21 Acute care staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.	•	•	•	•	•	•	•	•	•		•	91
R2-27 Rehab centre staff identifies the primary healthcare provider (ex: family physician) and a plan to inform this individual throughout all phases of care.		•	N/A	•	N/A				•	•		45

- In many rural areas, the emergency and acute care providers are the primary healthcare providers and therefore informed throughout all phases of care.
  In Winnipeg, the process of informing the primary health care provider depends on where the patient presents. If at one of the tertiary centres, the primary healthcare provider will receive an interim report and a discharge report after discharge. At the community hospital, the primary healthcare provider could well be the patient's own physician.
- In most regions, acute care staff identifies the primary healthcare provider and informs this individual throughout all phases of care.
- In general, the primary healthcare provider is identified at some phase in a stroke patient's care and a plan is developed to keep this individual informed throughout all phases of care.

11.3 Opportunities

Please note that there are no recommendations from the *Canadian Best Practice Recommendations for Stroke Care* (2006) applicable to this section.

- Burntwood and NOR-MAN use the provincial transfer referral form to manage transitions between sites. Use of this form as standard for patient transitions should be investigated.
- All regions indicate that the family physician is informed regarding the patient. However, this information should be timely to ensure that the physician is aware of the condition of the patient before the patient's next visit.
- A well-organized transition system will ensure that stroke patients in Manitoba will receive appropriate care throughout the continuum.

12.0 Stroke Education

With continuing new research and new treatment guidelines for stroke, it is important to ensure that physicians and staff are kept abreast of the latest evidence. Education is a vital part of the recovery process for all stroke survivors. Inclusion of the survivor, family members and both formal and informal caregivers enables them to have a better understanding of the needs of the patient and enhance recovery and coping.[13]

12.1 Key Findings

12.1.1 Physicians (Stroke Rounds)

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
R1-5 The region communicates with primary healthcare providers, such as family physicians, regarding stroke recognition information for their patients.				•	•	•						27
P1-8 The region provides communication to healthcare providers, such as family physicians, nurse practitioners and emergency departments regarding availability of and access to secondary prevention clinics.	•	•						•			•	36
P1-9 The region communicates with primary healthcare providers, such as family physicians, regarding the need for referral of all TIA patients for stroke prevention services.					•		•				•	27
E1-12 Emergency health care providers have specific training in the care of stroke patients.		•	•	•		•					•	45

- In general, communication on stroke services and TIA recognition with primary healthcare providers practicing within the regions is inconsistent or lacking.
- Stroke rounds occur monthly in Winnipeg and are attended by physicians in Brandon (via MB Telehealth) and occasionally by other regions. These rounds are organized by the Heart and Stroke Foundation of Manitoba and are sponsored by two pharmaceutical companies.
- Physicians in Central health region receive stroke education through Medical and Critical Care Teams and Manitoba Healthy Living
- Physicians in Churchill are consulted by staff on a daily basis, as they cover emergency, inpatients and the primary care clinic. Family physicians are aware of stroke prevention clinics in Winnipeg and refer patients when appropriate.
- Some regions, including NOR-MAN and South Eastman, communicate the need for referral of TIA patients to stroke prevention clinics. In most regions, TIA awareness is lacking or informal.
- South Eastman is currently working with the Heart and Stroke Foundation to provide increased training for the emergency department physicians at Bethesda Hospital as well as training for nurses and EMS staff in early stroke recognition. The development of a Centre of Excellence at the Bethesda Hospital that will include investigation and care mapping is currently underway.
- The Heart and Stroke Foundation of Manitoba and some pharmaceutical companies are conducting stroke specific training sessions for physicians.

[13] Canadian Best Practice Recommendations for Stroke Care (2006)

12.1.2 Staff Education

Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-12 Emergency health care providers have specific training in the care of stroke patients.		•	•	•		•						36
A1-13 Acute stroke health care providers have specific training in the care of stroke patients.		•				•						18
A1-27 Acute care providers have up-to-date knowledge of available community resources for stroke survivors.		•			•	•						27
R2-9 Inpatient rehabilitation health care providers have specific training in the care of stroke patients.		•	N/A	•	N/A	•			•	•	•	67
R2-14 Outpatient rehabilitation health care providers have specific training in the care of stroke patients.		•		•		•	•		•		•	55
R2-19 Home-based rehabilitation health care Providers have specific training in the care of stroke patients.		•			N/A						•	20

- Few health regions communicate with primary healthcare providers, such as family physicians, regarding stroke recognition information for their patients or the need for referral of all TIA patients for stroke prevention services. Churchill provides services under one roof, which facilitates communication.
- Two health regions (Brandon and Interlake) have specific stroke care training for staff in emergency, acute care and rehabilitation.
- Four regions indicate that emergency staff receives specific training in the care of stroke patients. Such training includes the topics of how stroke affects patient behaviour, current best practices for stroke and stroke rehabilitation review. In Central, staff education is done through Medical and Critical Care Teams and Manitoba Healthy Living. ACLS is offered to all emergency department staff in Burntwood.
- Central offers an education program with the stroke protocol to all nurses.
- Acute care providers in most regions do not have specific training in the care of stroke patients or stroke services available in the community. Interlake information is provided to acute care staff about available community resources for stroke survivors and is updated bi-annually. NOR-MAN offers the Heart to Heart Program in acute care.
- About half of the regions with inpatient and outpatient rehabilitation services have staff with specific training in the care of stroke patients. Examples include:
  - NOR-MAN home care provides up-to-date information about available community resources to rehabilitation staff.
  - Parkland inpatient and outpatient PT/OT/SLP staff are trained in Best Practices for Stroke and post graduate courses and have up-to-date knowledge of available resources within the region.
  - South Eastman inpatient rehabilitation staff have stroke-specific training and neuro-developmental theory courses.
- Winnipeg inpatient, outpatient and home care rehabilitation staff have stroke-specific training in "How stroke affects patient's behaviour", current best practices for stroke and stroke rehabilitation review. Rehabilitation staff also has up-to-date knowledge of available resources within the region, ex: Stroke Recovery Association, Heart and Stroke Foundation of Manitoba, organizations that support seniors and individuals with disabilities and Winnipeg Regional Health Authority advisory councils. Staff can also take advantage of conferences and continuing education related to stroke care.
- Three regions have staff at home-based rehabilitation care with specific training in the care of stroke patients.

12.1.3 Patients
Responses by Region

Questions	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg	Response Percentage
E1-26 Emergency department(s) have patient/family education services for stroke patients.		•		•								18
A1-22 The region has patient/family education services for stroke patients (acute).						•					•	18
R2-28 The region has patient/family education services for stroke patients (rehabilitation).				•							•	18

- Patient/family education on stroke services available within the regions is lacking. Examples provided are limited to:
  - Brandon: Distribution of the Heart and Stroke Foundation "Let's Talk About Stroke" information binders to patients/caregivers within first 72 hours. "Stroke Care and t-PA Information for Patients and Families" information pamphlet is also available.
  - Central has patient/family education services for stroke patients in emergency and rehab, but not available during acute care.
  - Interlake makes some family education materials available for patients on discharge.

12.2 Opportunities
- Information and education should be provided for all stroke patients and their families and caregivers at all stages of care across the continuum.
  (See Appendix 5 - Recommendation 2)
- Physicians and staff caring for stroke patients should be encouraged to attend monthly Stroke Rounds as facilitated by Heart & Stroke Foundation of Manitoba and Department of Neurology, University of Manitoba.
- The Manitoba Provincial Stroke Framework Advisory Committee should consider the development of a provincial education plan to address the training needs of the different regions. Already existing training, EMS stroke recognition training, triage and TIA recognition should be leveraged to ensure physicians and care providers stay current on treatment protocols.
- Education and training materials from the Heart and Stroke Foundation should be readily available for all stroke patients.

13.0 Appendices

13.1 Appendix 1 – Environmental Scan Survey

Purpose Statement

The Winnipeg Regional Health Authority (WRHA) was contracted by Manitoba Health to conduct a province-wide and health region-specific environmental scan of current policies, programs, services and resources relating to stroke care in Manitoba.

The attached survey will be used to obtain an inventory of all resources relating to stroke care in Manitoba and is not intended to evaluate service delivery. Gaps will be identified and solutions will be proposed to Manitoba Health for improving access to stroke care for all Manitobans. The information obtained will be kept confidential to the members of the Manitoba Provincial Stroke Framework Advisory Committee (PSFAC). Summary information will be returned to participating regions. With the permission of the regions, policies, algorithms, and guidelines collected will be shared with the regions to improve and enhance their stroke care capabilities.

The environmental scan must be completed by August 30, 2006 and the first draft of the report will be available to PSFAC on September 12, 2006. The final report will be presented to Manitoba Health on October 13, 2006.

Instructions for Completing and Returning

The survey is organized in sections to represent the different areas along the continuum of stroke care and best practice as laid out in the "best practice guidelines for stroke care" from the Canadian Stroke Strategy. The sections can be separated and distributed to the most appropriate person to complete. Due to the diversity between regions, some of the questions may not be applicable to your region.

All sections and questions are optional, but you are encouraged to supply as much information as possible as this will help the PSFAC to plan future expansion of stroke services in Manitoba.

Please note that the answers should pertain to services offered in your region. If the space provided for the answers is not sufficient, feel free to attach the information on an additional sheet. Also, if there is anything we missed, feel free to let us know.

Where required, please mark the applicable answer

Yes ✓	No	or	(Yes)	No	or	☒

We ask you to please complete the inventory and fax it by Monday, August 28, 2006 to (204) 940 1763.

Additional information (policies, guidelines, etc.) can be emailed to cferreira@wrha.mb.ca or mailed to:

Christa Ferreira
WRHA Project Management Office
1800 – 155 Carlton
Winnipeg, MB R3C 4Y1

To reach us no later than August 30, 2006.

If you have any questions or concerns, please contact Christa at (204) 926 7141 or email her at cferreira@wrha.mb.ca

Thank you in advance for taking the time to complete this survey.

Demographics

Region:			
Contact Person:			
Title:			
Contact Information:			
Phone Number	Fax Number	Email	
Does your region support out-of province clients?		**Yes**	**No**
If Yes, please provide details			

Stroke Recognition

The following questions pertain to practices your region may employ to inform the public and healthcare professionals of the warning signs of stroke in an individual case and on taking immediate action.

1. In addition to efforts by the Heart and Stroke Foundation, the region has local public awareness programs for stroke recognition, including recognizing stroke symptoms, warning signs, and the appropriate actions to take.	**Yes**	**No**
If Yes, please provide details:		
2. The region prominently displays the warning signs of stroke and the appropriate actions to take in patient care areas (e.g. Emergency Waiting Areas).	**Yes**	**No**
If Yes, please provide details:		
3. The region prominently displays the warning signs of stroke and the appropriate actions to take in staff areas (e.g. Staff Rooms, Eating Areas).	**Yes**	**No**
If Yes, please provide details:		
4. The region makes educational brochures on stroke recognition widely available to the public.	**Yes**	**No**
If Yes, please provide details:		
5. The region communicates with primary healthcare providers, such as family physicians, regarding stroke recognition information for their patients.	**Yes**	**No**
If Yes, please provide details:		
Please add any additional information relevant to stroke recognition services within your region.		

Stroke Prevention

The following questions pertain to practices your region may employ to inform the general public, healthcare professionals, those at risk of a stroke, and stroke survivors, of major stroke risk factors and to develop strategies for reducing these factors in an effort to prevent strokes.

Health Promotion

Health promotion activities are activities aimed at broadly informing the public about stroke risk factors and how to address or avoid them. Examples may include partnering with organizations such as the Manitoba Tobacco Strategy, School Districts, and others.

1. The region engages in health promotion that informs the public about stroke risk factors and how to address or avoid them.	**Yes**	**No**
If Yes, please provide details:		

Primary Prevention

Primary prevention refers to individual-based clinical approach to disease prevention in otherwise healthy individuals with modifiable risk factors. Examples may include primary healthcare providers initiating discussions on and providing information on smoking cessation, active lifestyles, healthy low-fat diets, appropriateness of pharmaco-therapeutic agents in reducing risk, and other risk factor reduction strategies.

2. In general, **family physicians** practicing within your region engage in primary prevention activities (e.g. initiate discussions on stroke risk reduction and the importance of managing stroke risk factors with clients).	**Yes**	**No**
If Yes, please check ALL those that apply: Smoking Cessation ☐ Physical Activity ☐ Healthy Nutrition ☐ Blood Pressure Awareness ☐		
3. The region engages in primary prevention activities involving **other** healthcare providers (e.g. public health nurses, outreach workers, allied health, etc), such as initiating discussions on stroke risk reduction and the importance of managing stroke risk factors with clients in a primary care setting.	**Yes**	**No**
If Yes, please check ALL those that apply: Smoking Cessation ☐ Physical Activity ☐ Healthy Nutrition ☐ Blood Pressure Awareness ☐		

Secondary Prevention

Secondary prevention clinic refers to a hospital-based or community-based clinic designed to reduce the risk of recurrent events in individuals who have already experienced an event, such as a stroke or TIA. Secondary prevention clinics may include vascular clinics, stroke prevention clinics, hypertension clinics, or others.

4. The region has **hospital-based** secondary prevention clinic(s) e.g. vascular clinics, stroke prevention clinics, diabetes clinics, hypertension clinics, or others.					**Yes**	**No**
If Yes, complete table below:						
Hospital	Clinic name/type	Days per week offered	Hours per day offered	Personnel type	Estimated new referrals per month	
5. The region refers to hospital-based secondary prevention clinics in **other** regions.					**Yes**	**No**
If Yes, provide Region/facility:						
6. The region has **community-based** secondary prevention clinic(s), e.g. vascular clinics, stroke prevention clinics, diabetes clinics, hypertension clinics, or others.					Yes	No
If Yes, complete table below:						
Setting	Clinic name/type	Days per week offered	Hours per day offered	Personnel type	Estimated new referrals per month	
7. The region refers to community-based secondary prevention clinics in **other** regions.					**Yes**	**No**
If Yes, provide Region/facility:						
8. The region provides communication to healthcare providers, such as family physicians, nurse practitioners, emergency departments, etc. regarding availability of and access to secondary prevention clinics.					**Yes**	**No**

TIA (Transient Ischemic Attack)

9. The region communicates with primary healthcare providers, such as family physicians regarding the need for referral of all TIA patients for stroke prevention services.	**Yes**	**No**
10. Patients with TIAs are referred to stroke prevention clinics or a neurologist for urgent investigation and development of a care plan.	**Yes**	**No**

If Yes, complete table below:

Clinic/neurologist	Location	Estimated number of referrals per month	Estimated wait to access services (in days)

Please add any additional information relevant to the delivery and coordination of stroke prevention services within your region.

Pre-hospital Care

The following questions pertain to the practices your region employ for providing patient care before and during transport to hospital.

1. EMS/ambulances have an acute stroke protocol (i.e. stroke triage tool).	**Yes**	**No**
If Yes, please attach acute stroke protocol and criteria for inclusion and exclusion.		
2. There are formal bypass or diversion protocols between facilities for individuals meeting acute stroke protocol criteria (e.g. a designated stroke center or receiving facility).	**Yes**	**No**
If Yes, please provide example or reference:		
3. There is a pre-notification protocol from EMS to the receiving emergency department when a stroke patient is in transit, including estimated time of arrival.	**Yes**	**No**
4. There are formal policies/procedures describing the information required from paramedics on stroke patients (e.g. time of symptom onset, etc.).	**Yes**	**No**
If Yes, please attach.		
Please add any additional information relevant to pre-hospital stroke care in the region.		

Emergency Management

The following questions pertain to access to emergency services for stroke patients in the region, and corresponding practices the region may employ to ensure rapid and appropriate emergency management of stroke patients. There are additional questions pertaining to the practices the region employs to ensure an effective transition from emergency to other care settings.

Protocols, Procedures, Policies, and Clinical Practice Guidelines

1. Emergency Departments have a formal stroke triage protocol.	**Yes**	**No**
If Yes, please attach triage protocol.		
2. Emergency Departments conduct a baseline stroke assessment using a standardized scale.	**Yes**	**No**
If Yes, please indicate what scale is used (check ALL that apply) National Institutes of Health Stroke Scale (NIHSS) ☐ Canadian Neurological Scale (CNS) ☐ Other ☐ (Specify_____)		
3. What CTAS level is assigned to acute stroke patients (circle ONE)		
1 | 2 | 3 | 4 | 5		
4. Emergency Departments have a protocol for TIA recognition.	**Yes**	**No**
If Yes, please attach.		
5. Emergency Departments have formal procedures (i.e. care map, algorithms, or clinical practice guidelines) for stroke patients.	**Yes**	**No**
If Yes, please attach.		
6. Emergency Departments have a triage protocol for determining appropriateness for and administration of tPA.	**Yes**	**No**
If Yes, please attach.		
7. Emergency Departments have protocols for immediate clinical investigation of all strokes.	**Yes**	**No**
If Yes, please attach.		
8. Emergency Departments use a Stroke Team.	**Yes**	**No**
If a Stroke Team is used, please indicate ALL the members of that team: Emergency Physician ☐ Neurologist ☐ Internist ☐ Nurse ☐ Physiotherapist ☐ Occupational Therapist ☐ Speech-Language Pathologist ☐ Social Worker ☐ Physiatrist ☐ Pharmacist ☐ Dietitian ☐ Psychologist ☐ Nurse Practitioner ☐ Family/Caregiver ☐ Primary Care Physician ☐ Other: _____		

Access to Regional Emergency CT Scans

9. Emergency Department(s) in the Region have access to emergency CT scans.				Yes	No
If Yes, please complete the table:					
Emergency department or site	Emergency CT scan access (On site, or other site specify)	Hours available (e.g. 24 hours, 0800 – 1630, etc)	Estimated average wait time (Minutes)	Estimated longest wait time (Minutes)	

Access to Neurological Services

10. Emergency Department(s) in the Region have access to a neurologist.				Yes	No
If Yes, please complete the table:					
Emergency department or location	Access to neurologist (on site, by phone, or TeleHealth)	Hours available (e.g. 24 hours, 0800 – 1630, etc)	Estimated average response time (Minutes)	Estimated longest response time (Minutes)	

Access to other Diagnostic Services

11. Emergency Department(s) in the Region have access to the following diagnostic resources:		
MRI	Yes	No
- Radiologist who can read CT/MRI	Yes	No
Trans-thoracic echo	Yes	No
Trans-esophageal echo	Yes	No
Cerberal Angiogram	Yes	No
Carotid Duplex Ultrasound	Yes	No
Trans-cranial Doppler	Yes	No
ECG	Yes	No
If Yes to any of the above, please complete the table below:		

Diagnostic resource (from List Above)	Emergency department	Hours available (e.g. 24 hours, 0800 – 1630, etc)	Estimated average wait time (Minutes)	Estimated longest wait time (Minutes)

Specialized Staff Training

12. Emergency health care providers have specific training in the care of stroke patients.	Yes	No
If Yes, check those that apply: How stroke affects patient behaviour ☐ Current best practices for stroke ☐ Stroke rehabilitation review ☐ Other stroke care updates ☐ (Specify)		

Transition Management from Emergency to other Care Settings

The following questions pertain to practices the region employs for managing the patient transition between emergency departments or from an emergency setting to another care setting such as an acute setting, rehab setting, community setting, or home.

13. The region has formal policies/protocols for transition management of stroke patients from Emergency to Acute Care.	Yes	No
If Yes, please attach.		
14. The region has formal policies/protocols for transition management of stroke patients from Emergency to Rehabilitation.	Yes	No
If Yes, please attach.		
15. The region has formal policies/protocols for transition management of stroke patients from Emergency to Home-based or Community-based Care (i.e. Secondary Prevention Clinics).	Yes	No
If Yes, please attach.		
16. The region has formal relocation agreements between facilities for stroke patients.	Yes	No
If Yes, please attach.		
17. The region uses standardized information and processes between sites for managing transitions.	Yes	No
If Yes, please attach.		

18. The region has case management/transition services for stroke patients.	**Yes**	**No**
If Yes, please attach.		
19. When planning a stroke patient's transfer from emergency, a formal meeting or conference is held with the client and family.	**Yes**	**No**
20. Emergency Department staff identifies the primary healthcare provider (e.g. Family Physician) and a plan to inform this individual throughout all phases of care.	**Yes**	**No**
21. Care plans are developed and documented for all stroke patients while in Emergency.	**Yes**	**No**
22. Care plans are developed using a multi-disciplinary team approach.	**Yes**	**No**

23. If a multi-disciplinary team is used for care plan development, please indicate ALL the members of that team:

Emergency Physician	☐	Neurologist	☐
Internist	☐	Nurse	☐
Physiotherapist	☐	Occupational Therapist	☐
Speech-Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐
Primary Care Physician	☐	Other: _____	

Community Re-engagement

24. From emergency, patients can be referred to the following community-based agencies (check ALL those that apply):

Stroke prevention clinics	☐	Location: _____
Other secondary prevention clinics	☐	Location: _____
Community stroke survivor groups	☐	Location: _____
Provincial heart health program	☐	Location: _____
Home care/support referrals	☐	Location: _____
Long term care	☐	Location: _____

25. Follow-up assessments of health status, community participation, and links to prevention services are performed regularly.	**Yes**	**No**
If Yes, describe those responsible for follow-up and frequency of follow-up:		
26. Emergency Department(s) have patient/family education services for stroke patients.	**Yes**	**No**
If Yes, please attach.		

27. Please add any additional information relevant to the delivery and coordination of stroke care in the region's Emergency Department(s).

Acute Stroke Treatment

The following questions pertain to access to acute care services for stroke patients in the region, and corresponding practices the region may employ to ensure rapid and appropriate access to acute care for stroke patients. There are additional questions pertaining to the practices the region employs to ensure an effective transition from acute care settings to other care settings.

1. There are formal procedures/care guides for managing acute stroke patient care.	**Yes**	**No**
If Yes, please attach.		
2. Acute care areas have access to ***neurological*** services as needed.	**Yes**	**No**
If Yes, please identify from where:		
3. Acute care areas have access to ***neurosurgical*** services as needed.	**Yes**	**No**
If Yes, please identify from where:		
4. Which guidelines have influenced the organization of stroke care in your region (check all those that apply): Royal College of Physicians ☐ Scottish Intercollegiate Guideline Network ☐ American Stroke Association ☐ Australian Guidelines ☐ None ☐ Other ☐ (Specify_____)		
5. Baseline stroke assessments are done using standardized scales and tools (Check those that apply): National Institutes of Health Stroke Scale (NIHSS) ☐ Canadian Neurological Scale (CNS) ☐ Other ☐ (Specify_____)		

Access to other Diagnostic Services

6. Acute Care has access to the following diagnostic resources:		
MRI	**Yes**	**No**
- Radiologist who can read CT/MRI	**Yes**	**No**
Trans-thoracic echo	**Yes**	**No**
Trans-esophageal echo	**Yes**	**No**
Cerberal Angiogram	**Yes**	**No**
Carotid Duplex Ultrasound	**Yes**	**No**
Trans-cranial Doppler	**Yes**	**No**
ECG	**Yes**	**No**

If Yes to any of the above, please complete the table below:

Diagnostic resource (from list above)	Site	Hours available (e.g. 24 hours, 0800 – 1630, etc)	Estimated average wait times	Estimated longest wait time

7. The region has beds designated for acute care.				**Yes**	**No**
If Yes, please complete table below:					
Facility	Total number of beds	Number of beds designated for stroke patients	Estimated average number of admitted stroke patients per month	Estimated average length of stay (Days)	

8. The region has its own dedicated stroke unit(s).			**Yes**	**No**
If Yes, please complete table below:				
At what facility/facilities:	What types of patients are treated on the dedicated stroke unit?			
	Acute only	**Acute and Rehab**		
	Acute only	**Acute and Rehab**		

9. Assessing stroke patients in an acute setting uses a coordinated multi-disciplinary team approach.	**Yes**	**No**

10. Describe the staffing/personnel of the multi-disciplinary team, please indicate ALL the members of that team:

Emergency Physician	☐	Neurologist	☐
Internist	☐	Nursing	☐
Physiotherapist	☐	Occupational Therapist	☐
Speech/Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐
Primary Care Physician	☐	Other: _____	

11. The region is affiliated with/refers to a dedicated stroke unit in another region.	**Yes**	**No**
If Yes, please identify:		
12. Assessing stroke patients in an acute setting is done using a standardized outcome measurement tool (e.g. FIM).	**Yes**	**No**
If Yes, please describe:		
13. Acute stroke health care providers have specific training in the care of stroke patients.	**Yes**	**No**

If Yes, check those that apply:

How stroke affects patient behaviour	☐	Current best practices for stroke	☐
Stroke rehabilitation review	☐	Other stroke care updates	☐
		(Specify _____)	

Transition Management from Acute Care Settings to other Care Settings

The following questions pertain to practices the region employs for managing the patient transition between acute care settings or from an acute care setting to another care setting such as emergency, rehab setting, community setting, or home.

14. The region has formal policies/protocols for transition management between Acute Care Units.	**Yes**	**No**
If Yes, please attach.		
15. The region has formal policies/protocols for transition management of stroke patients from Acute Care to Rehabilitation.	**Yes**	**No**
If Yes, please attach.		
16. The region has formal policies/protocols for transition management of stroke patients from Acute Care to Home-based or Community-based Care (i.e. Secondary Prevention Clinics).	**Yes**	**No**
If Yes, please attach.		
17. The region has formal relocation agreements between facilities for stroke patients.	**Yes**	**No**
If Yes, please attach.		
18. The region uses standardized information and processes between sites for managing transitions.	**Yes**	**No**
If Yes, please attach.		
19. The region has case management/transition services for stroke patients.	**Yes**	**No**
If Yes, please attach.		
20. When planning a stroke patient's transfer from acute care units, a formal meeting or conference is held with the client and family.	**Yes**	**No**
21. Acute Care staff identifies the primary healthcare provider (e.g. Family Physician) and a plan to inform this individual throughout all phases of care.	**Yes**	**No**
22. The region has patient/family education services for stroke patients.	**Yes**	**No**
23. Care plans are developed and documented for all stroke patients on admission to Acute Care.	**Yes**	**No**
24. Care plans are developed using a multi-disciplinary team approach.	**Yes**	**No**

25. If Yes, please indicate ALL the members of that team:

Emergency Physician	☐	Neurologist	☐
Internist	☐	Nursing	☐
Physiotherapist	☐	Occupational Therapist	☐
Speech-Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐
Primary Care Physician	☐	Other:	

Community Re-engagement

26. From acute care, patients can be referred to the following community-based agencies (check ALL those that apply):

Stroke prevention clinics	☐	Location: _____
Other secondary prevention clinics	☐	Location: _____
Community stroke survivor groups	☐	Location: _____
Provincial heart health program	☐	Location: _____
Home care/support referrals	☐	Location: _____
Long term care	☐	Location: _____

27. Acute Care providers have up-to-date knowledge of available community resources for stroke survivors.	**Yes**	**No**
If Yes, describe where resources are available and how to access it:		
28. Follow-up assessments of health status, community participation, and links to prevention services are performed regularly.	**Yes**	**No**
If Yes, describe those responsible for follow-up and frequency of follow-up:		
29. The region provides respite for care givers.	**Yes**	**No**

30. Please add any additional information relevant to the delivery and coordination of acute stroke care.

Rehabilitation Management

The following questions pertain to access to rehabilitation services for stroke patients in the region, and corresponding practices the region may employ to ensure rapid and appropriate access to rehabilitation services for stroke patients. There are additional questions pertaining to the practices the region employs to ensure an effective transition from rehabilitation settings to other care settings.

Protocols, Procedures, Policies, and Clinical Practice Guidelines

1. The region has formal policies/procedures for assessing stroke survivors for rehabilitation potential.	**Yes**	**No**
If Yes, please attach.		
2. The region has formal policies/procedures for developing rehabilitation plans for each stroke client (inpatient/outpatient/home-based).	**Yes**	**No**
If Yes, please attach.		
3. The region uses standardized outcome measures for rehabilitation (e.g. FIM).	**Yes**	**No**
If Yes, please describe:		
4. The region participates in CIHI National Rehab Reporting.	**Yes**	**No**

Inpatient Rehabilitation Services

5. The region provides inpatient rehabilitation services.	**Yes**	**No**
If Yes, where:		
6. The region has beds designated for rehabilitation.	**Yes**	**No**

If Yes, please complete table below:

Facility/site	Total number of rehab beds	Number rehab beds designated for stroke patients	Estimated average number of admitted stroke patients per month	Estimated average length of stay (Days)

7. Inpatient rehab is provided by a multi-disciplinary team.	Yes	No

8. If Yes, please indicate ALL the members of that team:

Neurologist	☐	Internist	☐
Primary Care Physician	☐	Nurse	☐
Physiotherapist	☐	Occupational Therapy	☐
Speech-Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐
Other: _____			

9. Inpatient Rehab health care providers have specific training in the care of stroke patients.	Yes	No

If Yes, please check ALL that apply:

How stroke affects patient behaviour	☐	Current best practices for stroke	☐
Stroke rehabilitation review	☐	Other stroke care updates	☐

(Specify _____)

10. The region refers patients to inpatient rehabilitation services in another region.	Yes	No

If Yes, please identify:

Outpatient Rehabilitation Services

11. The region has access to outpatient rehabilitation services in the region	Yes	No

If Yes, please complete table below

Outpatient rehab service	Estimated number of new stroke patients referred per month	Is length of stay individualized or set?	Typical length of stay (Sessions/Weeks)

12. Outpatient rehab is provided by a multi-disciplinary team	Yes	No

13. If Yes, please indicate ALL the members of that team:

Neurologist	☐	Internist	☐
Primary Care Physician	☐	Nurse	☐
Physiotherapist	☐	Occupational Therapy	☐
Speech-Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐
Other: _____			

14. Outpatient Rehab health care providers have specific training in the care of stroke patients.	Yes	No

If Yes, please check ALL that apply:

How stroke affects patient behaviour	☐	Current best practices for stroke	☐
Stroke rehabilitation review	☐	Other stroke care updates	☐

(Specify _____)

15. The region refers patients to outpatient rehabilitation services in another region	Yes	No

If Yes, where:

Home-based Rehabilitation Services

16. The region has access to home-based rehabilitation services in the region			Yes	No
If Yes, please complete table below:				
Home-based service	Estimated number of new stroke patients referred per month	Is the care plan individualized or set?	Typical number of visits (Sessions/Weeks)	

17. Home-based rehab is provided by a multi-disciplinary team.	Yes	No

18. If a multi-disciplinary team is used for home-based rehabilitation, please indicate ALL the members of that team:

Neurologist	☐	Internist	☐
Primary Care Physician	☐	Nurse	☐
Physiotherapist	☐	Occupational Therapy	☐
Speech/Language Pathologist	☐	Social Worker	☐
Physiatrist	☐	Pharmacist	☐
Dietitian	☐	Psychologist	☐
Nurse Practitioner	☐	Family/Caregiver	☐
Stroke Survivor	☐	Case Manager	☐

Other: _____

19. Home-based Rehab health care providers have specific training in the care of stroke patients.	Yes	No

If Yes, please check ALL that apply:

How stroke affects patient behaviour	☐	Current best practices for stroke	☐
Stroke rehabilitation review	☐	Other stroke care updates	☐

(Specify _____)

Transition Management

The following questions pertain to practices the region employs for managing the patient transition between the rehabilitation centre to another care setting such as an emergency department, acute setting, rehab setting, community setting, or home.

20. The region has formal policies/protocols for transition management from Rehab to Emergency or Acute Care Stroke Units.	Yes	No

If Yes, please attach.

Appendices

21. The region has formal policies/protocols for transition management between Rehab Centres.	**Yes**	**No**
If Yes, please attach.		
22. The region has formal policies/protocols for transition management from Rehab Centres to Home-based or Community-based stroke care (i.e. Secondary Prevention Clinics).	**Yes**	**No**
If Yes, please attach.		
23. The region has formal relocation agreements between facilities for stroke patients.	**Yes**	**No**
If Yes, please attach.		
24. The region uses standardized information and processes between sites for managing transitions.	**Yes**	**No**
If Yes, please attach.		
25. The region has case management/transition services for stroke patients.	**Yes**	**No**
26. When planning a stroke patient's discharge from a rehab setting, a formal meeting is held with the client and family.	**Yes**	**No**
27. Rehab Centre staff identifies the primary healthcare provider (e.g. Family Physician) and a plan to inform this individual throughout all phases of care.	**Yes**	**No**
28. The region has patient/family education services for stroke patients.	**Yes**	**No**

Community Re-engagement

29. From rehab, patients can be referred to the following community-based agencies (check ALL those that apply): Stroke prevention clinics ☐ Location: _____ Other secondary prevention clinics ☐ Location: _____ Community stroke survivor groups ☐ Location: _____ Provincial heart health program ☐ Location: _____ Home care/support referrals ☐ Location: _____ Long term care ☐ Location:		
30. Rehab providers have up-to-date knowledge of available community resources for stroke survivors.	**Yes**	**No**
If Yes, describe where resources are available and how to access it:		
31. Follow-up assessments of health status, community participation, and links to prevention services are performed regularly.	**Yes**	**No**
If Yes, describe those responsible for follow-up and frequency of follow-up:		
32. The region provides respite for care givers.	**Yes**	**No**

31. Please add any additional information relevant to the delivery and coordination of stroke rehabilitation services.

"Thank You" for taking the time to support this project!

The Analysis Team

13.2 Appendix 2 – Policies/Protocol/Guidelines

The regions supplied the following guidelines, policies or protocols. For copies of these policies, please contact the regional health authority directly.

Region	Policy
Assiniboine	• Referral Process for Non-Orthopedic Rehabilitation Patients • Home Care Referral/Intake Form
Brandon	• Clinical Practice Guidelines for Acute Stroke • Stroke Care and t-PA Information for Patients and Families • EMS – Suspected Stroke Algorithm • Acute Stroke Clinical Practice Guideline: Emergency Department/Intensive Care Unit(ED/ICU)-tPA Candidates • Inclusion/Exclusion Criteria Checklist for Thrombolytic (tPA) Treatment of Acute Ischemic Stroke • Nursing Protocol for Acute Ischemic Stroke • National Institutes of Health (NIH) Stroke Scale • Swallowing Screening Tool • Thrombolytic (tPA) Standing Orders for Acute Ischemic Stroke • Acute Ischemic Stroke: Post Thrombolytic (tPA) Standing Orders: Intensive Care Unit • Acute Stroke Clinical Practice Guideline: Acute Management, Rehab and Community Care • Acute Stroke Clinical Practice Guideline: Standing Orders (tPA not given) • Acute Stroke Medical Unit and Inpatient Rehab Plan of Care • Depression Screening Scale • Care Giver Strain Index (CSI) • Acute Stroke Rehab Progress Evaluation • Chedoke McMaster Stroke Assessment – Disability Inventory Scoring Sheet; Impairment Inventory Scoring Sheet • Berg Balance Scale Scoring Sheet • Stroke CPG – Real time Chart Audit – Acute Care • Stroke CPG – Real time Chart Audit – Rehabilitation
Central	• Acute Stroke Care Map (CVA Protocol) • The 5ml Water Swallow Screening Protocol for Acute CVA • Cognition and Communication Screen
Interlake	• ICD10 CA Stroke Codes • CVA Care Map • Patient/Family Stroke Careguide • Physiotherapy – CVA Assessment Form
Parkland	• DRHAC Rehabilitation Program – Goal Sheet • Criteria for Admission to Rehabilitation Program
South Eastman	• Referral, Admission, Discharge, Transfer Policy • Rehab Unit Policy – Rehabilitation Program • Rehab Unit Policy – Family Conference
WRHA	• Orders: tPA For Ischemic Stroke - Post IV tPA • Emergent management of arterial hypertension for persons receiving thrombolytic drugs for acute ischemic stroke. • Inclusion/Exclusion Criteria for Use of tPA in Acute Stroke • ER Stroke Triage Algorithm – HSC • ER Stroke Triage Algorithm – Community Hospitals

13.3 Appendix 3 - Additional Data

Stroke Separation Summary 1999/2000 to 2003/2004

A. Manitoba Overview

Between April 1, 1999 and March 31, 2004, there were 13,999 discharges from Manitoba facilities with a diagnosis related to cerebrovascular disease (ICD-9 codes 430 through 438). These discharges represent 10,897 individuals who were discharged once with a stroke diagnosis from Manitoba facilities and 2,332 individuals with multiple stroke discharges within five years, accounting for 5,434 discharges. Multiple stroke discharges for individuals range from two to 24 discharges, which includes 452 same-day transfers of 408 individuals between facilities with potential stroke diagnoses for the same event. The crude hospital separation rate was 24.3 per 10,000 insured Manitobans.

The annual number of stroke discharges has been decreasing gradually from 3,051 in 1999/00 to 2,571 in 2003/04; this reflects a decrease of the crude stroke separation rate from 26.7/10,000 to 22.2/10,000.

Fiscal Year	Separations	Per cent	Crude Rate/10000
1999/00	3,051	21.8	26.7
2000/01	2,941	21.0	25.6
2001/02	2,830	20.2	24.5
2002/03	2,606	18.6	22.5
2003/04	2,571	18.4	22.2

Stroke separations include a wide range of cerebrovascular conditions, with about one third of hospital discharges due to acute, but ill-defined,cerebrovascular disease.

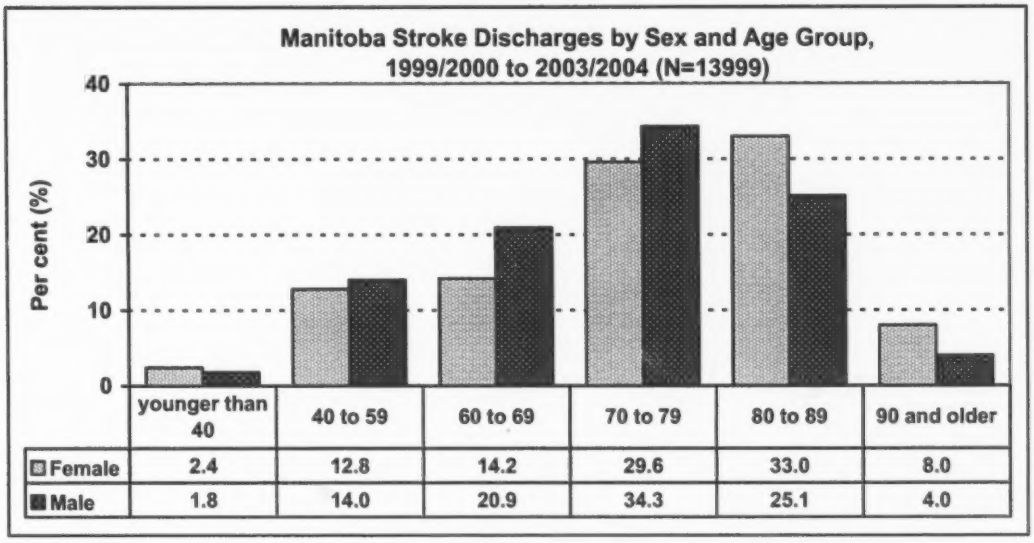
Most Responsible Diagnosis	Separations	Per cent
Subarachnoid hemorrhage	382	2.7
Intracerebral hemorrhage	775	5.5
Other and unspecified intracranial hemorrhage	418	3.0
Occlusion and stenosis of precerebral arteries	2,580	18.4
Occlusion of cerebral arteries	1,825	13.0
Transient cerebral ischemia	2,502	17.9
Acute,but ill-defined,cerebrovascular disease	4,448	31.8
Other and ill-defined cerebrovascular disease	450	3.2
Late effects of cerebrovascular disease	619	4.4

The sex distribution of stroke related hospital separations was similar to the Manitoba population with 7,024 (50.2 per cent) female and 6,975 (49.8 per cent) male discharges.

Stroke is a health condition associated with the elderly population, with more than two thirds of stroke discharges (67.1 per cent) occurring past the ages of 70 years old. Age specific stroke hospital separation rates increase from 0.9/10,000 in the younger than 40 years of age group to 220.4/10,000 (2.2 per cent) in the group 80 years of age and older.

Age Group	Separations	Per cent	Age-Specific Rate/10,000
younger than 40	291	2.1	0.9
40 to 59	1,874	13.4	12.2
60 to 69	2,452	17.5	56.5
70 to 79	4,472	32.0	124.9
80 to 89	4,070	29.1	217.6
90 and older	840	6.0	234.9

Manitoba females experience strokes at an older age than Manitoba males, with 41.1 per cent of female stroke discharges related to patients 80 years of age and older compared to 29.1 per cent of male stroke discharges of patients 80 years of age and older.



	younger than 40	40 to 59	60 to 69	70 to 79	80 to 89	90 and older
Female	2.4	12.8	14.2	29.6	33.0	8.0
Male	1.8	14.0	20.9	34.3	25.1	4.0

2,004 of the 13,999 hospital admissions (14.3 per cent) resulted in death while being in hospital. The risk of not surviving a stroke-related hospital admission increases with age, with 10.0 per cent of stroke patient deaths younger than 80 years of age and 22.3 per cent of stroke patient deaths in the group 80 years of age and older.

Age Group	Deaths	Per cent of Separations
younger than 40	22	7.6
40 to 59	150	8.0
60 to 69	200	8.2
70 to 79	539	12.1
80 to 89	817	20.1
90 and older	276	32.9

The risk of stroke death is slightly higher for females at 15.6 per cent of female stroke hospital separations compared to male deaths at 13.0 per cent of male stroke hospitalizations.

B. Regional and Facilities Overview

Crude cerebrovascular disease hospital separation rates vary widely by RHA, with the lowest rates between about 18 and 23 separations per 10,000 insured individuals in Winnipeg, Brandon, Burntwood/Churchill, NOR-MAN and South Eastman; intermediate rates between 29 and 32 separations/10,000 in Central, Interlake and North Eastman; and highest separation rates between 39 and 41 per 10,000 in Assiniboine and Parkland. However, these differences must be interpreted with caution because they are not adjusted for the different age structures of regions.

Region of Residence	Separations	Per cent	Crude Rate /10,000
Winnipeg	6,712	47.9	20.5
Brandon	543	3.9	22.9
North Eastman	572	4.1	29.1
South Eastman	629	4.5	22.9
Interlake	1,179	8.4	31.5
Central	1,428	10.2	29.1
Assiniboine	1,405	10.0	39.6
Parkland	873	6.2	40.9
NOR-MAN	227	1.6	18.1
Burntwood/Churchill	431	3.1	18.9

Stroke services in Manitoba are delivered by 95 facilities ranging from remote Nursing Stations to the St. Boniface and Health Sciences Centre teaching hospitals in Winnipeg. One third of cerebrovascular separations occur at the teaching hospitals. Almost two thirds (63.5 per cent) of stroke service facilities are small with less than 50 beds, covering about a quarter (25.4 per cent) of all Manitoba stroke discharges.

Facility Type	Facilities	Per cent	Separations	Per cent
Nursing Station	16	16.7	120	0.9
1-49 beds	61	63.5	3,557	25.4
50-199 beds	9	9.4	2,519	18.0
200-399 beds	5	5.2	3,012	21.5
Teaching Hospital	2	2.1	4,679	33.4
Federal Hospital	2	2.1	108	0.8

Larger facilities are concentrated in the urban areas with two teaching hospitals in Winnipeg and other facilities with more than 200 beds in either Winnipeg or Brandon. On the other hand, there are no facilities with more than 49 beds in Assiniboine, North Eastman and Churchill (see table *Facility Types by Region.*).

Since more advanced stroke diagnostic and treatment services are available at larger facilities, a flow of patients from regions with smaller facilities may occur to regions with larger facilities. In fact, almost a quarter of stroke separations in Winnipeg (22.7 per cent) and Brandon (24.8 per cent) originate in other RHAs. On the other hand, almost one-half of the stroke separations associated with North Eastman (45.5 per cent) and Interlake (40.6 per cent) are treated in other RHAs. However, the majority of strokes in Manitoba (82.7 per cent) are discharged in the region of residence. Details of stroke discharge flows between regions are in table *Stroke Separations by Residence and Facility Location.*

	Same RHA Separations	From other RHA		To other RHA	
		Separations	Per cent	Separations	Per cent
Winnipeg	6,518	1911	22.7	194	2.9
Brandon	364	120	24.8	179	33.0
North Eastman	312	20	6.0	260	45.5
South Eastman	425	52	10.9	204	32.4
Interlake	700	81	10.4	479	40.6
Central	1,035	85	7.6	393	27.5
Assiniboine	1,074	81	7.0	331	23.6
Parkland	706	45	6.0	167	19.1
NOR-MAN	153	8	5.0	74	32.6
Burntwood/Churchill	292	17	5.5	139	32.3

3,018 (21.6 per cent) of stroke separations result in transfers to other facilities. Transfers between facilities are not necessarily associated with a cerebrovascular diagnosis at both destination and origin facility. Only 452 transfers had a stroke related diagnosis at both origin and destination facility, and separation and re-admission on the same day. The majority of these transfers (72.3 per cent) occur within a region. Winnipeg is the main recipient (59.2 per cent) and also the main point of origin (24.8 per cent) of same-day stroke transfers between regions.

Facility Type by Region

	Total		Nursing Station		1-49 beds		50-199 beds		200-399 beds		Teaching Hospital		Federal Hospital	
	Fac.	Sep.	Fac.	Sep.	Fac.	Sep.	Fac.	Sep.	Fac.	Sep.	Fac.	Sep.	Fac.	Sep.
Winnipeg	8	8429	.	.	1	251	1	971	4	2528	2	4679	.	.
Brandon	1	484	.	.	.	.	.	.	1	484	.	.	.	.
North Eastman	7	332	3	11	4	321	.	.	.	.	.	.	.	.
South Eastman	4	477	.	.	3	213	1	264	.	.	.	.	.	.
Interlake	8	781	.	.	6	456	1	250	.	.	.	.	1	75
Central	15	1120	.	.	12	603	3	517	.	.	.	.	.	.
Assiniboine	22	1151	.	.	22	1151	.	.	.	.	.	.	.	.
Parkland	8	751	.	.	7	473	1	278	.	.	.	.	.	.
NOR-MAN	3	161	.	.	2	66	1	95	.	.	.	.	.	.
Burntwood/ Churchill	19	309	13	109	4	23	1	144	.	.	.	.	1	33

Stroke Separations by Residence and Facility Location

	Facility RHA									
Region of Residence	Winnipeg	Brandon	North Eastman	South Eastman	Interlake	Central	Assiniboine	Parkland	NOR-MAN	Burntwood/ Churchill
Winnipeg	6518	9	17	18	57	26	31	23	<5	11
Brandon	165	364	.	.	.	.	12	<5	<5	.
North Eastman	216	.	312	19	12	12	.	.	<5	.
South Eastman	184	.	<5	425	<5	17	.	.	.	.
Interlake	469	<5	<5	.	700	<5	<5	.	<5	<5
Central	324	6	.	13	<5	1035	31	16	.	.
Assiniboine	209	91	.	<5	<5	23	1074	<5	.	.
Parkland	143	12	.	.	<5	<5	<5	706	<5	.
NOR-MAN	66	<5	.	.	<5	.	<5	.	153	<5
Burntwood/Churchill	135	.	.	.	.	.	.	<5	<5	293

C. Length of Stay

Hospital lengths of stay due to cerebrovascular disease range from same day discharge to almost 11 years (3,919 days). Almost one quarter (24.5 per cent) of stroke discharges occur on the day of admission or on the next day. Another 30 per cent (30.5 per cent) are discharged within one week of admission. However, about 16 per cent (16.2 per cent) stay in hospital for longer than one month (31 days) after being diagnosed with stroke. Very long hospital stays are generally associated with several co-morbidities. Short lengths of stay are notable in the two teaching hospitals where 41.5 per cent of cerebrovascular separations occur on the day of admission or on the next day. On the other hand, separations that included a same day transfer were associated with longer lengths of stay, as 55.1 per cent of the 452 transfers had a combined length of stay of longer than one month.

Length of Stay	Separations	Per cent
<=1 day	3,429	24.5
2 to <7 days	4,265	30.5
7 to <14 days	2,152	15.4
14 to <31 days	1,881	13.4
31+ days	2,272	16.2

The type of cerebrovascular condition is a major determinant for the resulting length of hospital stay. The shortest lengths of stays are associated with occlusion and stenosis of pre-cerebral arteries where 63.3 per cent of separations occur on the same or next day of admission and transient cerebral ischemia where 76 per cent of discharges occur within less than one week of admission. On the other hand, more than 40 per cent of separations associated with occlusion of cerebral arteries (49.4 per cent) and subarachnoid hemorrhage (42.4 per cent) had lengths of stays exceeding two weeks, and 59.3 per cent of separations related to late effects of cerebrovascular disease exceeded one month of hospital stay.

Most Responsible Diagnosis	length of stay percentage of stroke separations				
	<=1 day	2 to <7 days	7 to <14 days	14 to <31 days	31+ days
Subarachnoid hemorrhage	20.7	16.0	20.9	28.0	14.4
Intracerebral hemorrhage	21.8	28.3	15.9	14.8	19.2
Other and unspecified intracranial hemorrhage	21.3	42.8	15.3	9.3	11.2
Occlusion and stenosis of precerebral arteries	63.5	25.7	4.3	3.8	2.7
Occlusion of cerebral arteries	5.6	24.1	20.8	20.9	28.6
Transient cerebral ischemia	28.5	47.5	14.5	6.4	3.0
Acute,but ill-defined,cerebrovascular disease	11.5	27.7	20.7	18.9	21.3
Other and ill-defined cerebrovascular disease	20.9	45.1	11.8	13.1	9.1
Late effects of cerebrovascular disease	5.3	12.8	9.4	13.3	59.3

13.4 Appendix 4 - Inter-Provincial Stroke Services

Assiniboine Regional Health Authority
Provides care to anyone within or traveling through or living over the Saskatchewan border who regularly utilize health services within the region.

Brandon Regional Health Authority
Supports patients from southwestern Saskatchewan.

Burntwood Regional Health Authority
Out-of-province clients are provided acute care and outpatient service that would be covered through reciprocal billing. If a client has a private health care plan, the service would be provided and the third party would be billed.

Churchill Regional Health Authority
Provide services to Kivalliq region of Nunavut.

Interlake Regional Health Authority
The region provides support for out-of-province clients for emergency care purposes. Generally, we do not provide support for hospital-based elective treatments other than episodic walk-in style primary health care.

NOR-MAN Regional Health Authority
The NOR-MAN Regional Health Authority, particularly at Flin Flon site, provides acute, ambulatory, diagnostic and emergency services to approximately 8,0000 residents of northeastern Saskatchewan. The region is not mandated to provide all health services in all communities as there are a number of agencies providing health service in the region such as Manitoba Health and First Nations & Inuit Health Branch nursing stations. The J.A. Hildes Northern Medical Unit provides physician services to some First Nations communities.

North Eastman Health Association
EMS provides response to all clients/patients, both residents and non-residents of Manitoba.

Parkland Regional Health Authority
Parkland region borders Saskatchewan, so medical services are provided to Saskatchewan residents as required (ex: emergency department).

Winnipeg Regional Health Authority
When there is a request for service, the patient is usually in Manitoba for some reason and then gets into a medical/surgical crisis and needs some rehabilitation before returning to the community.
The Winnipeg region has also organized transfer back to home province. The home care program, community stroke care service, provides case co-ordination services for clients that are being discharged from Riverview Health Centre and on consultation from Health Sciences Centre, Acute Care. In-patients at the hospital sites may be from out-of-province. In these situations, the case coordinator would be involved in discharge planning.

13.5 Appendix 5 – Recommendations from Canadian Stroke Strategy

1 Public Awareness and Responsiveness

1.1 | PUBLIC AWARENESS AND RESPONSIVENESS

All persons (members of the public) should be able to recognize and identify at least two signs and symptoms of stroke (sudden weakness, sudden trouble speaking, sudden vision problems, sudden headache, sudden dizziness) and know to take appropriate action (seek immediate medical attention). (CSQCS V; Evidence Level III)

2 Patient & Family

2.1 | PATIENT AND CAREGIVER EDUCATION

2.1a. Information and education should be provided for all patients with stroke and their families and caregivers, at all stages of care across the continuum (prevention, acute care, rehabilitation, community reintegration). It should address: the nature of stroke and its manifestations, signs and symptoms, impairments and their impact and management, risk factors, planning and decision making, resources and community support. (CSQCS, RCP, NZ, and Australian; Evidence Level A)

2.1b. Information and education should be interactive, timely, up to date, provided in a variety of languages and formats (written, oral, counselling approach), and specific to patient, family, and caregiver needs and impairments. (CSQCS, RCP, NZ, and Australian; Evidence Level A/B)

3 Prevention of Stroke

3.1 | LIFESTYLE MANAGEMENT

Persons at risk of stroke and patients who have had a stroke should be assessed for and given information about risk factors, lifestyle management issues (exercise, smoking, diet, weight, alcohol, stress management), and be counselled about possible strategies to modify their lifestyle and risk factors. (Adapted from RCP, NZ, Australian, VA/DOD, HSFO; Evidence Level III/C/R)

The lifestyle and risk factors and interventions include:

- Exercise: moderate exercise (an accumulation of 30 to 60 min) of brisk walking, jogging, cycling or other dynamic exercise 4 to 7 days each week. Medically supervised exercise programs for high risk patients (e.g. those with cardiac disease). (CHEP, NZ, ASA; Evidence Level A–B/ I–II)
- Smoking: smoking cessation; nicotine replacement therapy and behavioural therapy. (CSQCS, ASA, RCP; Evidence Level II/B–C)
- Diet: diet that is low in fat (especially saturated fat) and sodium, and high in fruit and vegetables. (RCP, ASA; Evidence Level II/B)
- Weight: maintain goal of a BMI of 18.5 to 24.9 kg/m2 and a waist circumference of <88cm for women and <102 cm for men. (CHEP, ASA; Evidence Level II/B–C)
- Alcohol consumption: no alcohol to moderate consumption (less than two standard drinks per day). Men: less than 14 drinks per week/Women: less than 9 drinks per week. (Australian, ASA; Evidence Level C/III)
- Stress management: individualized cognitive behaviour interventions are more likely to be effective when relaxation techniques are employed. (CHEP; Evidence Level C/III)

3.2 | BLOOD PRESSURE MANAGEMENT

3.2a. Blood Pressure Assessment:

- All persons at risk of stroke should have their blood pressure measured at each healthcare encounter. (RCP, CHEP; Evidence Level C)
- Patients found to have elevated blood pressure should undergo thorough assessment for the diagnosis of hypertension following the current guidelines of the Canadian Hypertension Education Program. (ASA, CHEP, RCP; Evidence Level A)

3.2b. Blood Pressure Management:

- Patients with ischemic stroke who are beyond the hyper-acute period should be prescribed anti-hypertensive treatment to target normal blood pressure. (ASA, CSQCS, CHEP, RCP; Evidence Level A)
- Target blood pressure levels as per the Canadian Hypertension Education Program (CHEP) guidelines for prevention of stroke and other vascular events.
  - CHEP guideline recommendations 2006:
    - For the prevention of first stroke in the general population: < 140 mm Hg systolic and < 90 mm Hg diastolic as minimal target.
    - For the prevention of first or recurrent stroke in patients with diabetes or chronic kidney disease: < 130 mm Hg systolic and < 80 mm Hg diastolic.
    - Blood pressure lowering is recommended in patients with blood pressure < 140/90 who have had a stroke.

3.3 | LIPID-MANAGEMENT

3.3a. Lipid Assessment:

- Fasting lipid levels (TC, TG, LDL-C, HDL-C) should be measured every 1 to 3 years and other cardiovascular risk factors assessed for all men 40 years or older, and women who are post-menopausal and /or 50 years or older. (CDS, VA/DOD, Class IIa, Level C). More frequent testing should be performed for patients with abnormal values or if treatment is initiated[5]
- Screen at any age adults with major CAD risk factors (such as diabetes, smoking, hypertension, obesity, cardiovascular disease, chronic kidney disease, lupus, exertional chest discomfort, evidence of atherosclerosis). (CDG; Evidence Level IIa/C)

3.3b. Lipid Management:

- Ischemic stroke patients with LDL-C of >2.0 mmol/ L should be managed with lifestyle modification, dietary guidelines, and medication recommendations. (CSQCS, Australian, VA/DOD; Evidence Level A)
- Statin agents should be prescribed for all patients who have had an ischemic stroke/TIA event (Australian, VA/DOD; evidence level A), in order to achieve a target goal of an LDL-C of <2.0 mmol/L and TC/HDL-C < 4.0 mmol/L. (CDS, CSQCS; Evidence Level A).

3.4 | DIABETES MANAGEMENT

3.4a. Diabetes Assessment:

- All individuals should be evaluated annually for type 2 diabetes risk on the basis of demographic and clinical criteria. (CDA; Evidence Level D)
- A fasting plasma glucose (FPG) should be performed every 3 years in individuals > 40 years of age to screen for diabetes. (CDA; Evidence Level D) More frequent and/or earlier testing with either an FPG or plasma glucose drawn two hours after a 75-g oral glucose load should be considered in people with additional risk factors for diabetes. (CDA; Evidence Level D) Some of these risk factors include: family history, high risk population, vascular disease, history of gestational diabetes, hypertension, dyslipidemia, overweight, abdominal obesity, polycystic ovary syndrome.
- In adults fasting lipid levels (TC, HDH-C, TG and calculated LDL-C) should be measured at the time of diagnosis of diabetes and then every 1 to 3 years as clinically indicated. More frequent testing should be performed if treatment for dyslipidemia is initiated. (CDA; Evidence Level D)
- Blood pressure should be measured at every diabetes visit. (CDA; Evidence Level D)

3.4b. Diabetes Management:

- Glycemic targets must be individualized (CDA, ESI; Evidence Level III); however, therapy in most patients with type 1 or type 2 diabetes should be targeted to achieve an A1C ≤7.0% in order to reduce the risk of microvascular (CDA; Evidence Level A/I) and macrovascular complications. (CDA; Evidence Level C)
- To achieve an A1C ≤7.0%, patients with type 1 or type 2 diabetes should aim for FPG or preprandial PG targets of 4.0 to 7.0 mmol/L and 2-hour postprandial PG targets of 5.0 to 10.0 mmol/L. (CDA; Evidence Level B)
- If it can be safely achieved, lowering PG targets toward the normal range should be considered (CDA; Evidence Level C/3): A1C ≤6.0% (CDA; Evidence Level D); FPG/preprandial PG: 4.0 to 6.0 mmol/L (CDA; Evidence Level D); and 2-hour postprandial PG: 5.0 to 8.0 mmol/L. (CDA; Evidence Level D)
- Adults at high risk of a vascular event should be treated with a statin to achieve an LDL-C < =2.0 mmol/L. (CDA; Evidence Level A/1)
- Unless contraindicated, low dose ASA therapy (80 to 325 mg/day) is recommended in all patients with diabetes with evidence of CVD, as well as for those individuals with atherosclerotic risk factors that increase their likelihood of CV events. (CDA; Evidence Level A)

3.5 | ANTIPLATELET THERAPY

All patients with ischaemic stroke or transient ischaemic attack should be on antiplatelet therapy (ASA) for secondary prevention of recurrent stroke unless there is an indication for anticoagulation or a contraindication to ASA. (CSQCS, ASA, NZ, RCP, Australian, VA/DoD; Evidence Level A) Usual maintenance dosage is 81–325 mg per day. (VA/DoD, CSQCS)

- There is evidence to support the use of alternative antiplatelet agents, including extended-release dipyridamole plus ASA, or clopidogrel. (RCP, Australian, ASA; Evidence Level A)
- Long-term combinations of aspirin and clopidogrel are not recommended. (Evidence Level A)

3.6 | ANTITHROMBOTIC THERAPY FOR ATRIAL FIBRILLATION

3.6a. For primary prevention of stroke in patients with atrial fibrillation, ASA or anticoagulation with warfarin should be considered based on the clinical circumstances. (BPS-WG; Evidence Level A)

3.6b. Patients with stroke and atrial fibrillation should be treated with warfarin at a target INR of 2.5, range 2.0 to 3.0, (target INR of 3.0 for mechanical cardiac valves, range 2.5 to 3.5), if they are likely to be compliant with the required monitoring and are not at high-risk for bleeding complications. (CSQCS, ASA, Australian, SIGN, VA/DoD; Evidence Level A/I)

3.7 | CAROTID INTERVENTION

Patients with symptomatic carotid artery disease of 70–99% stenosis (measured at angiography or by two concordant non-invasive imaging modalities) should be offered carotid intervention (carotid endarterectomy) within 2 weeks of the incident stroke or TIA. (CSQCS, SIGN 14, NZ, ASA; Evidence Level A)

- Carotid intervention is recommended for selected patients with moderate (50 to 69%) symptomatic stenosis. These patients should be evaluated by a physician with expertise in stroke management. (CSQCS, SIGN 14, NZ, ASA; Evidence Level A)
- The standard of care procedure is carotid endarterectomy. (BPS-WG; Evidence Level A)
- Carotid endarterectomy (CEA) should be performed by a surgeon with a known perioperative morbidity and mortality of <6%. (CSQCS, NZ, ASA; Evidence Level A)
- Carotid stenting may be offered open-label to those patients who are not operative candidates for technical, anatomical, or medical reasons. (BPS-WG; Evidence Level C)
- Carotid endarterectomy is contraindicated for patients with mild (<50%) stenosis. (CSQCS, SIGN 14, ASA; Evidence Level A)

4 Acute Stroke Management

4.1 | ACUTE STROKE UNIT CARE

Patients admitted to hospital because of an acute stroke should be treated in an interdisciplinary stroke unit. (CSQCS, SCORE, SIGN 64; Evidence Level A/I)

- A stroke unit is a specialized, geographically defined hospital unit dedicated to the management of stroke patients. (Australian, RCP; Evidence Level A/I)
- The core interdisciplinary team should consist of appropriate levels of medical, nursing, nutrition, occupational therapy, physiotherapy, social work and speech-language pathology staff. Additional disciplines may include pharmacy, (neuro) psychology and recreation therapy. (SIGN 64, Australian, SCORE; Evidence Level B)
- The interdisciplinary team should assess patients within 48 hours of admission and formulate a management plan. (BPS-WG; Evidence Level C)
- Clinicians should use standardized, valid assessments to evaluate the patient's stroke-related impairments and functional status. (RCP, BPS-WG; Evidence Level III)

4.2 | BRAIN IMAGING

All patients with suspected acute stroke should undergo brain imaging immediately. In most instances, the modality of choice is a non-contrast Computer-assisted Tomographic (CT) scan. If Magnetic Resonance Imaging (MRI) is performed, the scan should include diffusion-weighted sequences to detect ischemia, and gradient echo and FLAIR sequences for hemorrhage. (CSQCS, RCP, NZ; Evidence Level B)

4.3 | BLOOD GLUCOSE

All patients with suspected acute stroke should have their blood glucose concentration checked immediately. Blood glucose measurement should be repeated if the first value is abnormal or if the patient is known to have diabetes. Hypoglycemia should be corrected immediately. Markedly elevated blood glucose concentrations should be treated with glucose lowering agents. (CSQCS, Australian; Evidence Level B-C)

4.4 | ACUTE THROMBOLYTIC TREATMENT

All acute ischemic stroke patients should be evaluated to determine their eligibility for treatment with intravenous tissue-plasminogen activator (tPA) using the criteria from the National Institute of Neurological Disorders and Stroke (NINDS) rt-PA Stroke Study. Administration of t-PA should follow the American Stroke Association guidelines. (ASA, CSQCS, RCP; Evidence Level A-B)

- All eligible patients should receive tPA within one hour of hospital arrival. ("Eligible patients" refers to those who arrive at hospital within 3 hours of the onset of stroke symptoms and where tPA is not contraindicated.) (CSQCS, RCP; Evidence Level B-C)

4.5 | CAROTID ARTERY IMAGING

Carotid imaging should be performed within 24 hours of a carotid territory TIA or non-disabling ischemic stroke unless the patient is clearly not a candidate for carotid endarterectomy. (CSQCS, BPS-WG, SIGN14; Evidence Level B)

4.6 | DYSPHAGIA ASSESSMENT

4.6a. All patients with stroke should have their swallow screened prior to initiating oral intake of fluids or food utilizing a simple valid reliable bedside testing protocol. (CSQCS, SCORE, SIGN 78, NZ; Evidence Level B)

4.6b. Patients with stroke presenting with features indicating dysphagia or pulmonary aspiration should receive a full clinical assessment of swallowing by an SLP or appropriately trained specialist who should advise on safe swallow and consistency of diet and fluids. (RCP, CSQCS, SCORE, NZ; Evidence Level A)

4.7 | ACUTE ASPIRIN THERAPY

After brain imaging has excluded intracranial hemorrhage all acute stroke patients should be given at least 160 mg of acetylsalicylic acid (ASA) immediately as a one time loading dose. (RCP, NZ, SIGN13; Evidence Level A)

- In patients treated with r-tPA, ASA should be delayed until after the 24-hour post-thrombolysis scan has excluded intracranial hemorrhage. (RCP, NZ; Evidence Level A)
- ASA (50-325 mg daily) should then be continued indefinitely or until an alternative antithrombotic regime is started. (RCP; Evidence Level A)
- In dysphagic patients, ASA may be given by enteral tube or by rectal suppository. (RCP; Evidence Level A)

4.8 | MANAGEMENT OF SUBARACHNOID AND INTRACEREBRAL HEMORRHAGE

4.8a. Patients with suspected subarachnoid hemorrhage should have an urgent neurosurgical consultation for diagnosis and treatment. (BPS-WG; Evidence Level B)

4.8b. Patients with cerebellar hemorrhage should have an urgent neurosurgical consultation for consideration of craniotomy and evacuation of the hemorrhage. (BPS-WG; Evidence Level C)

4.8c. Patients with supratentorial intracerebral hemorrhage should be cared for on a stroke unit. (BPS-WG; Evidence Level B-C)

5 Stroke Rehabilitation

5.1 | INITIAL STROKE REHABILITATION ASSESSMENT

5.1a. All people admitted to hospital with acute stroke should have an initial assessment by rehabilitation professionals as soon as possible after admission (RCP Level A); preferably within the first 24–48 hours. (NZ; Evidence Level C)

5.1b. All people with acute stroke not admitted to hospital should undergo a comprehensive outpatient assessment(s) which includes a medical evaluation and functional assessments (RCP; Evidence Level A), preferably within two weeks. (BPS-WC; Evidence Level C/D)

5.1c. Clinicians should use standardized, valid assessments to evaluate the patient's stroke-related impairments and functional status, and encourage patient's participation in community and social activities. (AHA-ASA; Evidence Level III)

5.2 | PROVISION OF INPATIENT REHABILITATION

All patients with stroke who are admitted to hospital and who require rehabilitation should be treated in a comprehensive or rehabilitation stroke unit by an interdisciplinary team. (Australian Rehabilitation; Evidence Level A/I)

- Post-acute stroke care should be delivered in a setting in which rehabilitation care is formally coordinated and organized. (AHA-ASA; Evidence Level 1)
- All patients should be referred to a specialist rehabilitation team on a geographically defined unit as soon as possible after admission. (RCP; Evidence Level A)
- Post-acute stroke care should be delivered by a variety of treatment disciplines, experienced in providing post stroke care, to ensure consistency and reduce the risk of complications. (RCP; Evidence Level C)
- The interdisciplinary team may consist of a physician, nurse, physical therapist, occupational therapist, speech and language pathologist, psychologist, recreation therapist, patient and family/caregivers. (ASA-AHA; Evidence Level 1). This "core" interdisciplinary team should consist of appropriate levels of these disciplines, as identified by the Stroke Unit Trialists' Collaboration. (SIGN 64; Evidence Level B)
- The interdisciplinary team should assess patients within 24–48 hours of admission, and develop a comprehensive rehabilitation plan to reflect the severity of the stroke and the needs and goals of the stroke survivor. (HSFO, NZ; Evidence Level C)
- Stroke unit teams should conduct at least one formal interdisciplinary meeting per week to discuss the progress and problems, rehabilitation goals, and discharge arrangements for patients on the unit. (SIGN 64; Evidence Level B)
- Standardized assessment tools should be used to assess the functional status of stroke patients. (AHA-ASA; Evidence Level II)
- Where admission to a stroke rehabilitation unit is not possible, longer-term inpatient rehabilitation should be provided on a mixed rehabilitation unit (i.e. where interdisciplinary care is provided to patients disabled by a range of disorders including stroke). (SIGN 64; Evidence Level B)

5.3 | COMPONENTS OF INPATIENT STROKE REHABILITATION

All patients with stroke should begin rehabilitation therapy as early as possible once medical stability is reached. (AHS/ASA; Evidence Level I)

- Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate. (RCP; Evidence Level A)
- The team should promote the practice of skills gained in therapy into the patient's daily routine in a consistent manner. (RCP; Evidence Level A)
- Therapy should include repetitive and intense use of novel tasks that challenge the patient to acquire necessary motor skills to use the involved limb during functional tasks and activities. (SCORE; Evidence Level A)
- Stroke unit teams should conduct at least one formal interdisciplinary meeting per week at which patient problems are identified, rehabilitation goals set, progress monitored, and support after discharge planned. (SIGN 64; Evidence Level B)

5.4 | IDENTIFICATION AND MANAGEMENT OF POST-STROKE DEPRESSION

All patients with stroke should be considered to be at a high level of risk for depression. The clinical team should assess the patient's prior history of depression and previous risk factors of depression as part of the initial screening. All patients with stroke should be screened for depression initially and at three-month intervals or key stages of the rehabilitation process and after rehabilitation services has been discontinued. (BPS-WG; Evidence Level A)

- Patients diagnosed with a depressive disorder should be given a trial of antidepressant medication, if no contraindication exists. The Working Group makes no recommendation for the use of one class of antidepressants over another; however, side effect profiles suggest that Serotonin-Specific Reuptake Inhibitors (SSRIs) may be favored in this patient population. (AHA-ASA; Evidence Level I)
- In patients with severe, persistent, or troublesome tearfulness, SSRIs are recommended as the antidepressant of choice. (AHA-ASA; Evidence Level I)
- Routine use of prophylactic antidepressants is not recommended in post stroke patients. (AHA-ASA; Evidence Level 1)
- Patients should be given information, advice and the opportunity to talk about the impact of illness upon their lives. (RCP; Evidence Level B)
- Patients with marked anxiety should be offered psychological therapy, given by an appropriately trained and supervised practitioner. (RCP; Evidence Level B)
- Patients and their carers should have their individual psychosocial and support needs reviewed on a regular basis as part of the longer-term management of stroke. (RCP; Evidence Level A)

5.5 | SHOULDER PAIN ASSESSMENT AND TREATMENT

5.5a. Factors that contribute to, or exacerbate, shoulder pain should be identified and managed appropriately.

- Educate staff and carers about correct handling of the hemiplegic arm. (RCP, SCORE; Evidence Level B)
- Consider use of supports for the arm. (RCP; Evidence Level A)

5.5b. Joint protection strategies should be instituted to minimize joint trauma.

- The shoulder should not be passively moved beyond 90 degrees of flexion and abduction unless the scapula is upwardly rotated and the humerus is laterally rotated. (SCORE; Evidence Level A)
- Overhead pulleys should not be used. (Ottawa Panel; Evidence Level A)
- The upper limb must be handled carefully during functional activities. (SCORE; Evidence Level B)
- Staff should position patients, whether lying or sitting, to minimize the risk of complications such as shoulder pain. (RCP; Evidence Level B)

5.5c. Shoulder pain and limitations in range of motion should be treated through gentle stretching and mobilization techniques focusing especially on external rotation and abduction. (SCORE; Evidence Level B)

5.6 | COMMUNITY-BASED REHABILITATION

Stroke survivors should continue to have access to specialized stroke care and rehabilitation after leaving hospital (acute and/or inpatient rehabilitation). (RCP; Evidence Level A)

- Early supported discharge services provided by a well resourced, coordinated specialist interdisciplinary team are an acceptable alternative to more prolonged hospital stroke unit care and can reduce the length of hospital stay for selected patients. (SIGN 64; Evidence Level A) In addition, early supported discharge services to generic (non-specific) community services should not be undertaken. (RCP; Evidence Level A) See rationale below for explanation of early supported discharge.
- People who have difficulty in activities of daily living (ADL) should receive Occupational Therapy or multi-disciplinary interventions targeting ADL. (Australian; Evidence Level 1)
- Multifactorial interventions provided in the community including an individually prescribed exercise program, may be provided for people who are at risk of falling, in order to prevent or reduce the number and severity of falls. (Australian; Evidence Level 1)

6

Follow-up and Community Reintegration After Stroke

6.1 | FOLLOW-UP AND EVALUATION IN THE COMMUNITY

6.1a. Stroke survivors and their caregivers should have their individual psychosocial and support needs reviewed on a regular basis. (RCP; Evidence Level A)

6.2b. Any stroke survivor with reduced activity at six months or later after stroke should be assessed for appropriate targeted rehabilitation. (RCP; Evidence Level A)

6.3c. People living in the community who have difficulty with ADL should have access, as appropriate, to therapy services to improve, or prevent deterioration in ADL .(Australian; Evidence Level I)

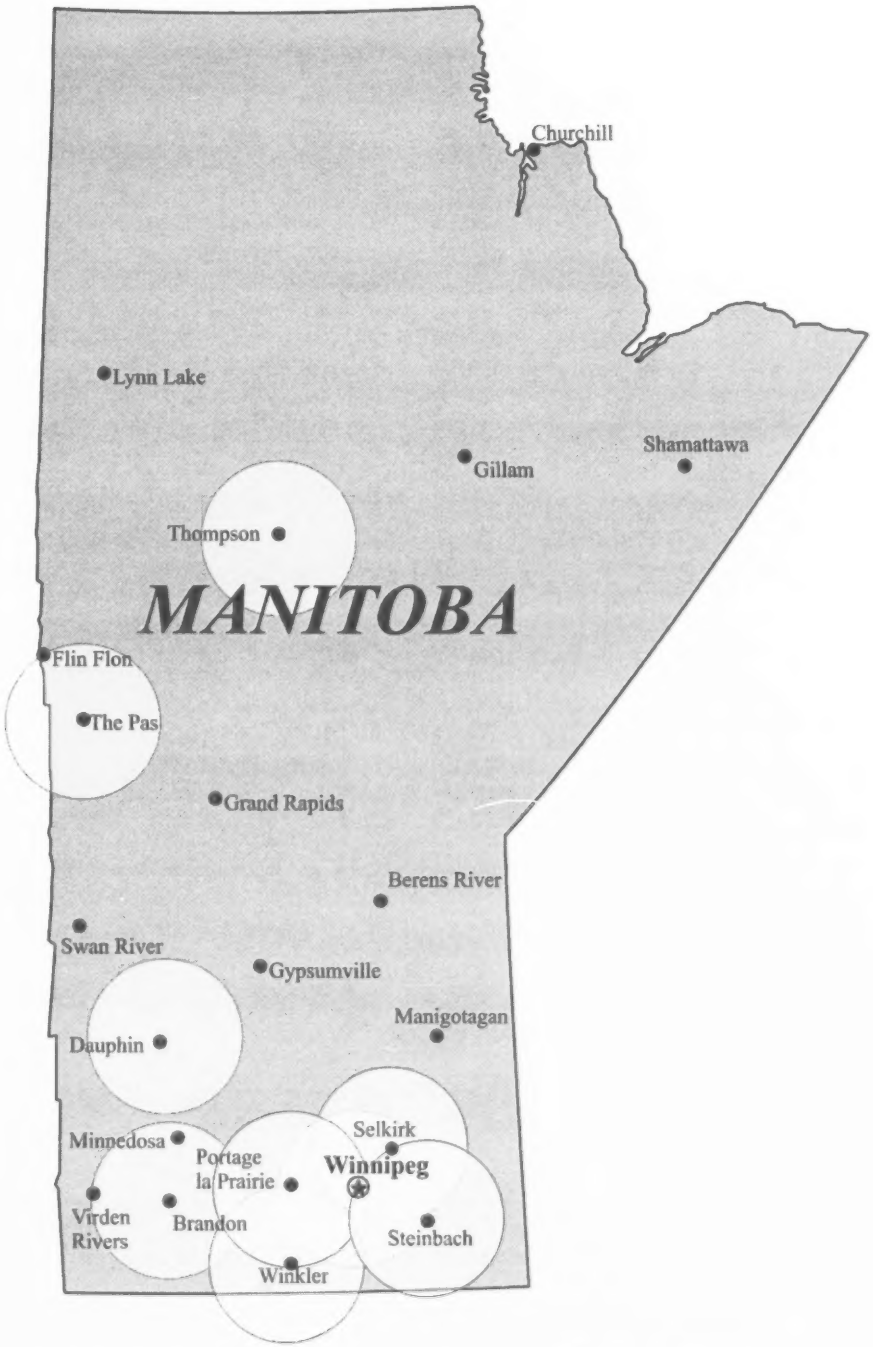
6.4d. Recommendation # 21 (Identification and Management of Post-Stroke Depression) should also be observed as part of follow-up and evaluation of stroke survivors in the community. (BPS-WG)

13.6 Appendix 6 – CTAS Guideline

The Canadian Association of Emergency Physicians
L'Association canadienne des médecins d'urgence
NENA National Emergency Nurses Affiliation Inc.
L'affiliation nationale des infirmières/infirmiers d'urgence incorporée
L'association des Médecins d'urgence du Québec
The Canadian E.D. Triage and Acuity Scale
Patients should have an INITIAL TRIAGE ASSESSMENT WITHIN 10 MINUTES* of arrival
TRIAGE LEVEL I - RESUSCITATION
Time to NURSE Assessment IMMEDIATE*
Time to PHYSICIAN Assessment IMMEDIATE*
USUAL PRESENTATION
SENTINEL DIAGNOSIS
Cardiac / Arrest
Major Trauma
Shock States
Near Death Asthma
Severe Respiratory Distress
Altered Mental State (unconscious, delirious)
Seizures
Traumatic Shock
Pneumothorax - Traumatic / Tension
Facial Burns with Airway Compromise
Severe Burns > 30% TBS
Overdose with Hypotension / Unconscious
AAA
ASA with Complications / CHF / Low BP
Status Asthmaticus
Head Injury - Major / Unconscious
Status Epilepticus
TRIAGE LEVEL II - EMERGENT
Time to NURSE Assessment IMMEDIATE*
Time to PHYSICIAN Assessment 15 MINUTES*
15
USUAL PRESENTATION
SENTINEL DIAGNOSIS
Head Injury (Risk Features ± Altered Mental State)
Severe Trauma
Altered Mental State (lethargic, drowsy, agitated)
Chemical Exposure - Eyes
Allergic Reaction (Severe)
Chest Pain • Visceral, Non-Traumatic
• ± Associated Symptoms
Overdose (conscious), Drug Withdrawal
ABD Pain (Age >50) with Visceral Symptoms
Back Pain (Non Trauma, Not MSK)
GI Bleed with Abnormal Vital Signs
CVA with Major Deficit
Asthma Severe (PEFR <49%)
Moderate / Severe Dyspnea / Difficulty Breathing
Vaginal Bleeding • Acute, Pain scale >6
• ± Abnormal Vital Signs
Vomiting and/or diarrhea
(with suspicion of dehydration)
Signs of serious infection (purpuric rash, toxic)
Chemotherapy or immunocompromised
Fever (age ≤ 3 months) Temp ≥ 38.0 (rectal)
Acute Psychotic Episode / Extreme Agitation
Diabetes: Hypoglycemia, Hyperglycemia
Headache (Pain Scale 8 - 10/10)
Pain Scale 8-10 (CVA, Back, Eye)
Sexual Assault
Neonate (≤ 7 days old)
Head Injury
Trauma, Multiple Sites, Multiple Rib Fracture,
Neck Injury / Spinal Cord
Alkaline / Caustic Ocular Burns
Anaphylaxis
AMI, Unstable Angina, CHF, Chest Pain NOS,
Gastroesophageal Reflux
Unspecified Drug / Medicinal Overdose, "d.t.'s"
AAA, Appendicitis, Cholecystitis
Gastrointestinal Bleed, Hypotension
CVA
Severe Asthma
COPD, Croup
Spontaneous Abortion
Ectopic Pregnancy / Rupture
Epiglottitis, Meningitis, Sepsis
Acute Psychotic Episode / Agitation
Hyperglycemia, Diabetic Ketoacidosis, Hypoglycemia
Migraine
Renal Colic, LBP / Strain (Disc), Keratitis, Iritis
TRIAGE LEVEL III - URGENT
Time to NURSE Assessment 30 MINUTES*
Time to PHYSICIAN Assessment 30 MINUTES*
30
USUAL PRESENTATION
SENTINEL DIAGNOSIS
Head Injury, Alert, Vomiting
Moderate Trauma
Abuse / Neglect / Assault
Vomiting and/or diarrhea (≤ 2 years)
Dialysis problems
Signs of Infection
Mild / Moderate Asthma (PEFR > 49%)
Mild / Moderate Dyspnea
Chest Pain • No Visceral Symptoms (Sharp/MSK)
• No Previous Heart Disease
GI Bleed with Normal Vital Signs
Vaginal Bleeding Acute, Normal Vital Signs
Seizure, Alert on Arrival
Acute Psychosis ± Suicidal Ideation
Pain Scale 8 - 10 / 10 with minor injuries
Pain Scale 4 - 7 / 10 (Headache, CVA, Back)
Head Injury
Anterior Dislocated Shoulder, Tibia / Fibula Fracture,
Simotheator, Trimalleolar Ankle Fracture
Pyelonephritis
Asthma without Status / COPD
Bronchiolitis / Croup, Pneumonia
Chest Pain NOS (MSK, GI, Resp)
GI Bleed, No complications
Spontaneous Abortion
Seizure
Acute Psychosis ± Suicidal Ideation
Migraine, Renal Colic, LBP / Strain (Disc)
TRIAGE LEVEL IV - LESS URGENT
Time to NURSE Assessment 60 MINUTES*
Time to PHYSICIAN Assessment 60 MINUTES*
60
USUAL PRESENTATION
SENTINEL DIAGNOSIS
Head Injury, Alert, No Vomiting
Minor Trauma
ABD Pain (Acute)
Earache
Chest Pain, Minor Trauma or MSK, No Distress
Vomiting and diarrhea (>2 years/no dehydration)
Suicidal Ideation / Depression
Allergic Reaction (Minor)
Corneal Foreign Body
Back Pain (Chronic)
URI Symptoms
Pain Scale 4 - 7
Headache (Non Migraine / Not Sudden)
Head Injury, Alert, No Vomiting
Colles Fracture, Ankle Sprain
Appendicitis, Cholecystitis
Otitis Media / Otitis Externa
Chest Pain NOS (MSK, GI, Resp),
Gastroesophageal Reflux
Suicidal Ideation / Depression
Urticaria
Corneal Foreign Body
LBP /Strain
URI
TRIAGE LEVEL V - NON URGENT
Time to NURSE Assessment 120 MINUTES*
Time to PHYSICIAN Assessment 120 MINUTES*
120
USUAL PRESENTATION
SENTINEL DIAGNOSIS
Minor Trauma, Not Necessarily Acute
Sore Throat, No Resp Symptoms
Diarrhea alone (no dehydration)
Vomiting alone normal mental status
(no dehydration)
Nausea
Minor Symptoms
ABD Pain (Chronic)
Psychiatric complaints
Pain Scale < 4
LBP / Strain
URI
Gastroenteritis
Vomiting
Disorders of Menstruation
Dressing Changes
Cast Changes
Constipation
Symptoms / Neurotic, Personality and
Nonpsychotic Mental Disorders
Unspecified Superficial Laceration(s)

* *TIMES TO ASSESSMENT* are operating objectives, not established standards of care. Facilities without onsite physician coverage may meet assessment objectives using delegated protocols and remote communication.

13.7 Appendix 7 – CT Scanner Locations in Manitoba



Circles represent a radius of 75 kilometers, or the approximate availability of a CT scan within a one-hour response time.

13.8 Appendix 8 - Community Referral Practices

Assiniboine Regional Health Authority

Referrals from Emergency:

secondary prevention clinics	Brandon and Assiniboine Regional Health Authority
community stroke survivors group	locally organized within the region
home care/support referrals	Assiniboine Regional Health Authority
long term care	Assiniboine Regional Health Authority

The respondent in this region is not aware of the provincial heart health program.

Referrals from Acute:

secondary prevention clinics	Assiniboine Regional Health Authority
community stroke survivors group	local groups
home care/support referrals	Assiniboine Regional Health Authority
long term care	Assiniboine Regional Health Authority

Referrals from Rehabilitation:

secondary prevention clinics	Assiniboine Regional Health Authority
community stroke survivors group	Local groups not organized by region
home care/support referrals	Assiniboine Regional Health Authority
long term care	Assiniboine Regional Health Authority

Brandon Regional Health Authority

Referrals from Emergency, Acute, Rehabilitation:

secondary prevention clinics	Prairie Health Matters, Brandon Regional Health Authority
community stroke survivors group	Brandon Regional Health Authority
home care/support referrals	Brandon Regional Health Authority
long term care	Brandon Regional Health Authority

"Let's talk about stroke" information binders are distributed to patients / caregivers within first 72 hours. Resources are mentioned in the "Let's talk about stroke" manual and through the community partners information.

Burntwood Regional Health Authority

Referrals from Emergency, Acute:

stroke prevention clinics	Health Sciences Centre
home care/support referrals	Thompson, Gillam, Lynn Lake

The Burntwood Regional Health Authority home care program provides support services at home. The Heart and Stroke Foundation, which previously had an office in Thompson, had its funding discontinued approximately five years ago.

Referrals from Rehabilitation:

home care/support referrals	Thompson, Gillam, Lynn Lake

The region does not have a rehabilitation program. The Heart and Stroke Foundation, which previously had an office in Thompson, had its funding discontinued approximately five years ago.

Regional Health Authority - Central

Referrals from Emergency:

home care/support referrals	throughout region
long term care	throughout region

Provides stroke survivor and family with Heart and Stroke Foundation pamphlets.

Referrals from Acute and Rehabilitation:

provincial heart health program	Winnipeg Regional Health Authority
home care/support referrals	Regional Health Authority - Central
long term care	Regional Health Authority - Central

Churchill Regional Health Authority

As all services are under one roof, acute care providers have up-to-date knowledge of available community resources for stroke survivors.

Referrals from Emergency	Home care/support referrals in Churchill
Referrals from Acute & Rehabilitation	Home care/support referrals in Churchill Long Term Care in Churchill

Interlake Regional Health Authority
Information for acute care providers about available community resources for stroke survivors is updated bi-annually.

NOR-MAN Regional Health Authority
From Emergency, patients can be referred to:
- provincial heart health program at primary health care centres
- regional home care/support services

From Acute and Rehabilitation, patients can be referred to:
- provincial heart health program at primary health care in The Pas, Flin Flon and Snow Lake
- home care/support services in The Pas, Flin Flon and Snow Lake
- long term care in The Pas, Flin Flon and Snow Lake

Rehabilitation staff have knowledge about available resources from home care.

North Eastman Health Association
Referrals from Acute:

home care/support referrals	Beausejour, Pinawa, Pine Falls
long term care	Whitemouth, Lac du Bonnet, Pine Falls

Referrals from Rehabilitation:

home care/support referrals	Pinawa, Pine Falls, Oak Bank

Parkland Regional Health Authority
From Emergency, patients can be referred to home care/support services at the regional community health locations.
From Acute care or Rehabilitation, patients can be referred to home care/support services at the regional community health locations and to a long term care location depending on the bed availability in the region.
Rehabilitation staff have up-to-date knowledge of available resources within the region.

South Eastman Health
Referrals from Emergency and Acute:

stroke prevention clinics	Winnipeg Regional Health Authority
other secondary prevention clinics	Winnipeg Regional Health Authority
community stroke survivor groups	Winnipeg Regional Health Authority
provincial heart health program	Winnipeg Regional Health Authority
home care/support referrals	South Eastman Health
long term care	South Eastman Health

Referrals from Rehabilitation:

home care/support referrals	any regional office
long term care	

Winnipeg Regional Health Authority
From Rehabilitation, referrals are made to:

stroke prevention clinics	Health Sciences Centre and St. Boniface General Hospital
other secondary prevention clinics	Winnipeg Regional Health Authority
community stroke survivor groups	Stroke Recovery Association (not consistent)
provincial heart health program	
home care/support referrals	Winnipeg Regional Health Authority
long term care	Winnipeg Regional Health Authority

Referrals from Acute and Rehabilitation:
Staff at Health Sciences Centre is able to consult the home care program, community stroke care service. In addition, all hospital sites have access to home care for assessment and discharge care planning.

13.9 Appendix 9 – Other Referenced Tables

13.9.1 Table 7 – Primary Prevention Activities

Family physicians engage in the following primary prevention activities:

Primary Prevention Activities	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg
Smoking Cessation		●	●	●	●	●		●	●	●	
Physical Activity		●	●	●	●	●		●	●	●	
Healthy Nutrition		●	●	●	●	●		●	●	●	
Blood Pressure Awareness		●	●	●	●	●		●	●	●	

The region engages in primary prevention activities with health care providers for:

Primary Prevention Activities	Assiniboine	Brandon	Burntwood	Central	Churchill	Interlake	NOR-MAN	North Eastman	Parkland	South Eastman	Winnipeg
Smoking Cessation		●	●		●	●	●	●	●	●	
Physical Activity		●		●	●	●	●	●	●	●	
Healthy Nutrition		●	●		●	●	●	●	●	●	
Blood Pressure Awareness		●		●	●	●	●	●	●	●	

13.9.2 Table 8 – Regional Emergency CT Scans

Region	Emergency Department or Site	Emergency CT Scan Access (On-site or other site, specify)	Hours Available (ex: 24 hours, 0800 – 1630)	Estimated Average Wait Time (minutes)	Estimated Longest Wait Time (minutes)
Assiniboine	Brandon	(none in ARHA)	24 hours	Not available	Not available
Brandon	Brandon Regional Health Centre	on-site	24 hours	~15-40	30-40
Burntwood	Thompson General Hospital	on-site	0830 - 1600 M-F	60	120
Central	Boundary Trails General Hospital	on-site	0800 - 1700 M-F	30	60
	Portage District General Hospital	on-site	0800 - 1700 M-F	30	60
Interlake	Selkirk	on-site and referred	0800 - 1600 M-F	Stat	
NOR-MAN	The Pas Hospital	on-site	0900 - 1600	Less than 24 hours.	
	Flin Flon Hospital	The Pas	0900 - 1600	Up to 24 hours	
North Eastman	Winnipeg		24 hours	4 hours	12 hours
	Selkirk				
Parkland	Dauphin Regional Health Centre	PDN to Brandon/Winnipeg	Emergent Varies based on: 1.RT on call with CT training 2.availability of radiologist in Winnipeg/ Brandon	45	several hours
South Eastman	Bethesda Hospital	on-site	0800 – 2400hrs	30	90
	Ste. Anne Hospital	Bethesda Hospital	2400 – 0800hrs	60	120
	Vita Hospital	Bethesda Hospital	2400 – 0800hrs	60	120
	De Salaberry	Bethesda Hospital	2400 – 0800hrs	60	120
Winnipeg	Health Science Centre	on-site	24 hours		
	St. Boniface General Hospital		24 hours		
	Grace General Hospital		24 hours (on-call after hours)		
	Seven Oaks General Hospital		24 hours (on-call after hours)		
	Victoria General Hospital		24 hours (on-call after hours)		
	Concordia General Hospital		24 hours (on-call after hours)		

13.9.3 Table 9. Emergency Access to Diagnostic Services By Region

Region	Emergency Department	Diagnostic Resource	Hours Available (ex:. 24 hours, 0800 – 1630)	Estimated Average Wait Time (minutes)	Estimated Longest Wait Time (minutes)
Assiniboine	Brandon	MRI			
	Brandon	Radiologist			
	Brandon	Trans-thoracic echo			
	Brandon	Trans-esophageal echo			
	Brandon	Carotid Duplex Ultrasound			
	Brandon and all 20 Assiniboine Regional Health Authority facilities	ECG	24 hours	Immediate	10-15 while waiting from call to arrival
Brandon	Brandon	MRI	24 hours	15-30	30
		Radiologist	24 hours		
		Trans-thoracic echo	24 hours	Urgent 4-48 hrs Depends on availability of cardiologist to read	
		Trans-esophageal echo	24 hours		
		Carotid Duplex Ultrasound	24 hours		
		ECG	24 hours	0	15
Burntwood	Thompson	EKG	24 hours	Less than 10	20
	Gillam	EKG	24 hours	Less than 10	20
	Lynn Lake	EKG	24 hours	Less than 10	20
Central	Boundary	ECG	24 hours	30	60
	Portage	ECG	24 hours	30	60
	Carman	ECG	24 hours	30	60
	Altona	ECG	24 hours	30	60
	Morris	ECG	24 hours	30	60
	Swan Lake	ECG	24 hours	30	60
	Notre Dame	ECG	24 hours	30	60
Churchill	Churchill	ECG	24 hours	5	15
Interlake	Winnipeg	MRI (On referral)			
	Selkirk	Radiologist			
	Selkirk	ECG			
NOR-MAN	The Pas Hospital	Radiologist	0900-1600		
	All sites	ECG	24 hours	Few	
North Eastman	Beausejour, Pine Falls, Pinawa	EKG	Weekdays 0830 – 1700	5-10	25-30
			Weekends, Holidays, after regular hours - on call	10-15	25-30
Parkland	Dauphin Regional Health Centre	Radiologist (CT)	0800-1600 3 weeks/month Mon-Fri	10	20
	Dauphin Regional Health Centre	ECG	0800-1600 Mon-Fri	10	20
			After Hours on-call	15	30

Region	Emergency Department	Diagnostic Resource	Hours Available (ex:. 24 hours, 0800 – 1630)	Estimated Average Wait Time (minutes)	Estimated Longest Wait Time (minutes)
Parkland	Roblin, Grandview, Ste. Rose, Swan River, Winnipegosis	ECG	0800-1600 Mon-Fri	10	20
			After Hours on-call	30	60
South Eastman	Bethesda Hospital	ECG	24 hours	15	60
	Ste. Anne Hospital	ECG	24 hours	15	60
	Vita Hospital	ECG	24 hours	15	60
	De Salaberry	ECG	24 hours	15	60
Winnipeg	Health Sciences Centre and St. Boniface General Hospital	MRI	on-call		
		Radiologist	on-call		
		Trans-thoracic echo	on-call		
		Trans-esophageal echo	on-call		
		Cerebral Angiogram	on-call		
		Carotid Duplex Ultrasound	on-call		
		Trans-cranial Doppler	on-call		
	All sites	ECG	24 hours		

13.9.4 Table 10. Acute Care Beds By Region

Region	Facility	Total Number of Beds
Assiniboine	All 20 facilities	348
Brandon	Brandon Regional Health Centre	206
Burntwood	Thompson General Hospital	59
Central	Boundary Trails Health Centre	94
	Portage District General Hospital	89
	Carman Memorial Hospital	28
	Altona Community Health Centre	22
	Lorne Memorial Hospital - Swan Lake	
	Notre Dame Medical Nursing Unit	
	Red River Valley Health Centre - Morris	
	St Claude Health Centre	
Churchill	Churchill	21
Interlake	Selkirk	
	Stonewall	
	Teulon	
	Arborg	
	Eriksdale	
	Ashern	
	Gimli	
NOR-MAN	The Pas Hospital	40
	Flin Flon Hospital	40
North Eastman	Pine Falls	23
	Beausejour	30
	Pinawa	17
Parkland	Ste Rose	26
	Dauphin RHC	92
	Roblin	23
	Winnipegosis	15
	Grandview	18
	Swan River	52
South Eastman	Bethesda Hospital	69
	Ste. Anne Hospital	22
	Vita Hospital	10
	De Salaberry	14
Winnipeg	Concordia	185
	Grace	257
	Health Sciences Centre	746 - six designated for stroke patients
	Seven Oaks	293
	St. Boniface	455
	Victoria	204

13.9.5 Table 11. Acute Care Access to Diagnostic Services By Region

Region	Site	Diagnostic Resource	Hours Available (ex: 24 hours, 0800 – 1630)	Estimated Average Wait Time (minutes)	Estimated Longest Wait Time (minutes)
Assiniboine	Brandon	MRI			
	Brandon	Radiologist			
	Brandon	Trans-thoracic echo			
	Brandon	Trans-esophageal echo			
	Brandon	Carotid Duplex Ultrasound			
	Brandon and all 20 Assiniboine Regional Health Authority facilities	ECG	24 hours	Immediate	10-15 while waiting from call to arrival
Brandon	Brandon	MRI	24 hours	15-30	30
		Radiologist	24 hours		
		Trans-thoracic echo	24 hours	Urgent 4-48 hrs Depends on availability of cardiologist to read	
		Trans-esophageal echo	24 hours		
		Carotid Duplex Ultrasound	24 hours		
		ECG	24 hours	0	15
Burntwood	Thompson	EKG	24 hours	10	20
	Gillam	EKG	24 hours	10	20
	Lynn Lake	EKG	24 hours	10	20
Central	Boundary	ECG	24 hours	30	60
		Radiologist	0700-1700	30	60
	Portage	ECG	24 hours	30	60
		Radiologist	0700-1700	30	60
	Carman	ECG	24 hours	30	60
	Altona	ECG	24 hours	30	60
	Morris	ECG	24 hours	30	60
	Swan Lake	ECG	24 hours	30	60
	Notre Dame	ECG	24 hours	30	60
Churchill	Health Centre	ECG	24 hours	5	15
Interlake	Selkirk	Carotid Duplex Ultrasound	0800 – 1600	Emergency - within 1 week Elective - 3-4 months	
NOR-MAN	The Pas Hospital	Radiologist	0900-1600		
	All sites	ECG	24 hours	5	N/A
North Eastman	Beausejour, Pine Falls, Pinawa	EKG	Weekdays 0830 – 1700	5-10	25-30
			Weekends, Holidays, After regular hours - on call	10-15	25-30
Parkland	Dauphin Regional Health Centre	Radiologist	0800-1600 3 weeks/month Monday-Friday	10	20
		ECG	0800-1600 Monday-Friday	10	20
			After hours on-call	15	30

Region	Site	Diagnostic Resource	Hours Available (ex: 24 hours, 0800 – 1630)	Estimated Average Wait Time (minutes)	Estimated Longest Wait Time (minutes)
Parkland	Roblin, Ste Rose, Grandview, Swan River, Winnipegosis	ECG	0800-1600 Monday-Friday	10	20
South Eastman	Bethesda	CT Scan	0800-1630hrs	Immediate	~2 days (weekends)
	All sites	ECG	24 hrs	Immediate	
Winnipeg	Health Sciences Centre and St. Boniface General Hospital	MRI	On-call		
		Radiologist	On-call		
		Trans-thoracic echo	On-call		
		Trans-esophageal echo	On-call		
		Cerebral Angiogram	On-call		
		Carotid Duplex Ultrasound	On-call		
		Trans-cranial Doppler	On-call		
	All sites	ECG	24 hours		

13.9.6 Table 12. Inpatient Rehabilitation Services by Region

Region	Facility/Site	Total Number of Rehabilitation Beds	Number Rehabilitation Beds Designated for Stroke Patients	Estimated Average Number of Admitted Stroke Patients Per Month	Estimated Average Length of Stay (days)
Assiniboine	Rivers	9	0	(not available at time of survey)	
Brandon	Assiniboine Centre	49	12	3 to 4	~6 weeks (42 days)
	Rivers Rehab Centre (ARHA)	11	0	0	N/A
Central	Boundary Trails Health Centre	25	19	not broken down by unit	
	Portage District General Hospital	26	12		
Interlake	Selkirk				
NOR-MAN	The Pas Hospital				
	Flin Flon Hospital				
North Eastman	Beausejour	0			
	Pinawa	0			
	Pine Falls	0			
Parkland	Dauphin RHC	8	0	1.42	46.71
	Swan River	16	0	1	60-90
South Eastman	Bethesda Hospital, Steinbach	16 (assessment/ rehabilitation)	as required within the 16 beds	4	37
Winnipeg	Deer Lodge Centre	64	10	5	68.5
	Riverview Health Centre	70	30	3	177.4
	Health Sciences Centre	44	0		

13.9.7 Table 13. Outpatient Rehabilitation Services

Region	Outpatient Rehab Service	Estimated Number of New Stroke Patients Referred per Month	Is Length of Stay Individualized or Set?	Typical Length of Stay (Sessions/Weeks)
Assiniboine	Limited through CTS			
Brandon	Brandon Regional Health Centre – Outpatient Department	2 to 3	individualized	depends on needs
Burntwood		2 to 3		
Central	Boundary Trails Health Centre	Not Tracked by diagnosis		
	Portage District General Hospital			
Churchill	Physiotherapy 3 days/Month	< 1/year	Individualized	
	Thompson General Hospital	2 to 3		
NOR-MAN	Physiotherapy	Less than 1	Individualized	
	Occupational Therapy	Less than 1	Individualized	
Parkland	Dauphin RHC	Less than 1	Individualized	3-6 months
	Swan River	Less than 1	Individualized	3-6 months
	Roblin	Less than 1	Individualized	3-6 months
	Ste Rose	Less than 1	Individualized	3-6 months
South Eastman	Bethesda Hospital	3 per year	Individualized	Variable
	Ste. Anne Hospital	1 per year	Individualized	Variable
	Vita Hospital	0		
	De Salaberry	2 per year	Individualized	Variable
Winnipeg	HSC	5	Individualized	2 per week; varies 6 weeks to 4 months
	MHC (Easy Street)	2 to 3	Individualized	5 to 6 months
	SBGH (PT/OT)	5-10 (CMIT Program)	Individualized	6 weeks
	DLC	+/- 5	Individualized	

13.9.8 Table 14. Home-based Rehabilitation Services

Region	Home-Based Service	Estimated Number of New Stroke Patients Referred per Month	Is the Care Plan Individualized or Set?	Typical Number of Visits (Sessions/Weeks)
Assiniboine	Regional	Unavailable	Individualized	Unavailable
Brandon	Home Care Program	~5	Individualized	Dependant on needs
Burntwood		2-3	Included in the Home Care Plan	# of visits affected by having only one occupational therapist who also provides acute care
Winnipeg	This is provided through the Home Care Program, Community Stroke Care Service.	10 /month The case coordinator's present caseload is approximately 70 clients followed in the community. This is in addition to responding to consults at the Health Sciences Centre and a 30+ bed stroke unit at Riverview Health Centre.	Individualized	During the active rehabilitation period typically following hospital discharge, clients would be seen 3 to 5 times per discipline involved (ex: OT, PT, SLP). Assessments / reassessments and treatment plans are completed by therapists. Treatment plans are typically implemented by rehab assistants with therapist delegation/direction.

13.9.9 Table 15. Hospital-based Secondary Prevention Clinics by Region

Region	Hospital	Clinic Name/Type	Comments
Assiniboine	At 17 sites	Diabetes Risk Factor Assessment	Offered 34 days per year. Estimated new referrals of 9 per year. Personnel includes dietitian, RN and EMS.
Burntwood	Thompson General		Dietitian-led
	Gillam Hospital		
	Lynn Lake		
Churchill	Churchill	Diabetes	Offered 5 days per week by RN/Dietitian
Winnipeg	HSC	Stroke Prevention	
	SBGH	Stroke Prevention	
	Grace	Vascular Clinic	
	Various Sites	Diabetes	

13.9.10 Table 16. Community-based Secondary Prevention Clinics by Region

Region	Setting	Clinic Name/Type	Comments
Assiniboine	Other community events	Diabetes Risk Factor Assessment	Offered 4 days per year, with an estimated 15 new referrals per year. Led by RD and RN.
Brandon	Prairie Health Matters	Focuses specifically on diabetes – but does a bit of heart & stroke education	Offered 5 days per week, 7 hours per day with estimated 2 to 3 new referrals per month. Led by RD and RN.
Burntwood	Pikwitonei		
	BCHRC	Diabetes Hypertension	
	Thicket Portage		
	Northern Consultation Clinic		
	Lynn Lake	Nutrition	
	Leaf Rapids		
	Gillam	Nutrition	
	Ilford		
	Wabowden		
Central	Portage	Regional Diabetes Program	Dietitian led with 10 new referrals per month
	Boundary Trails		Nurse led with 26 new referrals per month
Churchill	Northern Store	Random sugar and blood pressure screening	Held every 3 months for 4 hours by RN & EMS
Interlake	Deer Lodge Centre Winnipeg	Speech/swallowing	SLP / OT led
Parkland	Primary Health Care Centres Physician Clinics Community Centres	Diabetes Risk Factor & Complication Assessments	158 clients seen from Feb to Jun/06. Led by LPNs, RNs, RDs, Diabetes Educators and support staff
	Community Health Offices: 14 in total	Diabetes Education Resource 1:1 advanced level diabetes self-management education and care program	Offered 3 to 4 days per week (North Parkland), 8 hours per day, with estimated 22 new referrals per month. RN and RD led.

Region	Setting	Clinic Name/Type	Comments
South Eastman	Community offices throughout region	Diabetes & Healthy Living	Nurse-led, with some involvement from Dietitian. Approximately 11 new referrals per month.
		Risk Factor and Complication Assessment Clinic	

13.9.11 Table 17. Stroke Prevention Clinics by Region

Region	Clinic/Neurologist	Location	Comments
Brandon	Health Sciences Centre St. Boniface General Hospital	Winnipeg	
Burntwood	Stroke Prevention Clinic	Health Sciences Centre - Winnipeg	
	Nemoregrets	Winnipeg Regional Health Authority	
Churchill	Health Sciences Centre	Winnipeg	Approx. 1 referral per month and wait times of 1 to 2 days.
NOR-MAN	Neurologist (visiting)	Flin Flon	
South Eastman	Stroke Prevention Clinic	St Boniface, Winnipeg	
		Health Sciences Centre - Winnipeg	
Winnipeg	Stroke Prevention	Health Sciences Centre	30 to 50 referrals per month, with up to 60 day wait times.
	Stroke Prevention	St. Boniface General Hospital	30 to 50 referrals per month, with up to 60 day wait times.
	Vascular Clinic	Grace General Hospital	

13.10 Appendix 10 – Pediatric Stroke in Manitoba

Stroke in Children

Childhood stroke (stroke in newborns and children) is emerging as a serious and frequent disorder, one that affects over 6 per 100,000 children per year (1). The causes and risk factors of childhood stroke are multiple and differ significantly from those in adults. The consequences are lifelong motor and cognitive disability in over 60 percent, death in about 10 percent(1-5), and recurrent stroke in about 30 percent of the survivors of stroke (6-8).

Decreased quality of life is reported to occur in over 50 percent of survivors of childhood stroke, which affects not just the individual but the entire family and the community at large (9;10). Since childhood stroke will impact the individual and society for many more decades than adult stroke, there is a larger social and economic burden from childhood stroke than adult stroke. In one recent pilot study conducted at The Hospital for Sick Children, Toronto, the long term cost of illness in children with stroke averages CAD $ 21,311 per child per year in Canada (11). These costs, when projected over the life span of survivors of childhood stroke significantly exceed estimated costs of illness when compared to adult stroke survivors.

For the clinician, the diagnosis of stroke in children is a challenge. The first and foremost challenge is its recognition in children. Since stroke occurs infrequently in children, it is rarely considered as a possible diagnosis in a child with an acute neurological deficit. The usual belief is "stroke does not occur in children". The presentation is quite varied, subtle and non-specific in children and the differential diagnosis in these cases is broad. Hemiparesis may be erroneously attributed to migraine with aura, focal seizure, intracranial hemorrhage and tumors, focal encephalitis or demyelination because of their similar presentations and the increased familiarity of physicians with these conditions in children. To further confuse the issue, in children with seizures at the onset, ischemic stroke may be incorrectly diagnosed as ictal or post-ictal Todd's paresis. More subtle symptoms and signs are less likely to be attributed to stroke, particularly in infants and younger children in whom clinical examination is often quite challenging. All these factors contribute to delays in the diagnosis of childhood stroke.

The challenges in reaching a specific etiological diagnosis are compounded by the fact that children have multiple causes and risk factors which are age related and differ significantly from those in adults. Contrary to adults in whom atherosclerosis is the leading cause of stroke, common causes and risk factors of childhood stroke include(12):

1. Congenital and acquired cardiac diseases and interventions
2. Arteriopathies (diseases attacking the arteries such as moyamoya, post-varicella arteriopathy, dissection, etc.)
3. Prothrombotic and hematological disorders
4. Head and neck infection and trauma
5. Idiopathic: No cause identified in over 50 percent of children.

Prompt and corrects etiological diagnosis and identification of associated risk factors is necessary for appropriate and timely selection of acute thrombolytic therapy and also for the prediction of prognosis and recurrence rate.

The Canadian Pediatric Ischemic Stroke Registry (CPISR) has identified and prospectively enrolled over 1500 children with stroke from January 1992 to December 2005, including 933 with Arterial Ischemic Stroke (AIS), 467 with Cerebral Sinovenous Thrombosis (CSVT) and 108 Pre-natal or Peri-natal strokes (5). Of these, 88 patients (60 AIS, 14 CSVT and 14 Pre-natal or Peri-natal strokes) were enrolled from Winnipeg Children's Hospital, Manitoba.

Of the 933 patients (25 percent newborns) with arterial ischemic stroke enrolled in the CPISR 54 percent were males and 46 percent females.

The clinical presentation included:

1. Seizures in 49 percent (neonates 88 percent; 37 percent older children),
2. Focal neurological deficits in 66 percent (neonates 31 percent; 78 percent older children):
    a. Motor deficits 78 percent
    b. Speech 16 percent
    c. Visual 10 percent or
    d. Other deficits 32 percent
3. Diffuse and non-specific presentation in over 50 percent.

The risk factors for stroke included:

1. Cardiac disease or intervention 28 percent
2. Arteriopathy 60 percent
3. Prothrombotic disorders 27 percent
4. Acute systemic illness 44 percent
5. Chronic disease 35 percent.

Over 50 percent received antithrombotic treatment (13 percent of neonates vs. 60 percent older children). Outcomes included mild to moderate neurological deficits in 59 percent and severe deficit in 6 percent (42 percent neonates, 61 percent older), death in 13 percent (nine neonates, 15 percent older) and subsequent recurrent cerebral ischemia 9.4 percent (1 percent neonates, 13 percent older)(5).

In children, since disability from ischemic stroke will impact the individual and society for many more decades over their life span than for adults, the separation of 'stroke mimickers' from actual stroke and prompt evaluation with rapid neuroimaging is paramount. Lack of awareness of childhood stroke results in delayed and missed diagnosis as well as uneven approaches to investigation and management in individual patients. To overcome these challenges, systematic approaches for the recognition and evaluation of childhood stroke are required at both provincial and national level to establish the continuum of acute stroke care from recognition, prevention, transition from primary care centers, emergency management, acute treatment, rehabilitation management and community involvement. Important strategies required to overcome these challenges include:

1. Integrated stroke care by involvement of pediatric stroke into provincial and federal stroke strategies.
2. Development and implementation of a province based stroke strategy in children according to the best practice stroke care guidelines.
3. Establishing a network through which regional physicians and coordinators can be trained and educated about childhood stroke, particularly recognition of stroke symptoms in children and their timely evaluation and transfer to a tertiary care centre.
4. Changes in Pediatric Hospital Infrastructure with particular emphasis on:
    a. Prioritized and early triage and evaluation of children with stroke including rapid neuroimaging.
    b. Development of acute stroke care protocols in children's hospitals, based on best practice evidence.
    c. Development of comprehensive acute stroke care program in pediatric hospitals including pediatricians, neurologists, hematologists, thrombosis team, intensive care staff, neuroradiologists, cardiologists, rehabilitation and social services.
    d. Support for physicians in remote/distant hospitals via telehealth services and through collaboration and sharing of experiences.

5. Public awareness campaigns including media publicity and educational workshops about childhood stroke.

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13.11 Appendix 11 – Acknowledgments

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